User Guide

Scaling Matrix Switchers

ISM 482
## Integrated Scaling Matrix Switcher

Extron Electronics
INTERFACING, SWITCHING AND CONTROL

Safety Instructions

Safety Instructions • English

WARNING: This symbol, ⚠, when used on the product, is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

ATTENTION: This symbol, △, when used on the product, is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

For information on safety guidelines, regulatory compliances, EMI/EMF compatibility, accessibility, and related topics, see the Extron Safety and Regulatory Compliance Guide, part number 68-290-01, on the Extron website, **www.extron.com**.

## Instructions de sécurité • Français

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Sicherheitsanweisungen • Deutsch

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有關安全性指導方針、法規遵守、EMI/EMF 相容性、存取範圍和相關主題的詳細資訊, 請瀏覽 Extron 網站: **www.extron.com**, 然後參閱《Extron 安全性與法規遵守手冊》, 準則編號 68-290-01。

Japanese

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注意: この記号 △ が製品上に表示されている場合は、本機の取扱説明書に記載されている重要な操作と保守(整備)の指示についてユーザーの**注意**を喚起するものです。

安全上のご注意、法規厳守、EMI/EMF適合性、その他の関連項目については、エクストロンのウェブサイト**www.extron.jp**より『Extron Safety and Regulatory Compliance Guide』(P/N 68-290-01) をご覧ください。

Korean

경고: 이 기호 ⚠,가 제품에 사용될 경우, 제품의 인클로저 내에 있는 접지되지 않은 위험한 전류로 인해 사용자가 감전될 위험이 있음을 경고합니다.

주의: 이 기호 △, 가 제품에 사용될 경우, 장비와 함께 제공된 책자에 나와 있는 주요 운영 및 유지보수(정비) 지침을 경고합니다.

안전 가이드라인, 규제 준수, EMI/EMF 호환성, 접근성, 그리고 관련 항목에 대한 자세한 내용은 Extron 웹 사이트(**www.extron.com**)의 Extron 안전 및 규제 준수 안내서, 68-290-01 조항을 참조하십시오.

FCC Class A Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. The Class A limits provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause interference; the user must correct the interference at his own expense.

> **NOTE:** This unit was tested with shielded I/O cables on the peripheral devices. Shielded cables must be used to ensure compliance with FCC emissions limits.
>
> For more information on safety guidelines, regulatory compliances, EMI/EMF compatibility, accessibility, and related topics, see the **Extron Safety and Regulatory Compliance Guide** on the Extron website.

Specifications Availability

Product specification are available on the Extron website, **www.extron.com**.

Conventions Used in this Guide

Notifications

The following notifications are used in this guide:

> **CAUTION:** A caution indicates a situation that may result in minor injury.

> **ATTENTION:** Attention indicates a situation that may damage or destroy the product or associated equipment.

> **NOTE:** A note draws attention to important information.

Software Commands

Commands are written in the fonts shown here:

`^AR Merge Scene,,Op1 scene 1,1 ^B 51 ^W^C`

`[Ø1] R ØØØ4 ØØ3ØØ ØØ4ØØ ØØ8ØØ ØØ6ØØ [Ø2] 35 [17] [Ø3]`

`Esc X1 * X12 * X15 * X18 * X16 CE ←`

> **NOTE:** For commands and examples of computer or device responses mentioned in this guide, the character "Ø" is used for the number zero and "O" is the capital letter "o."

Computer responses and directory paths that do not have variables are written in the font shown here:

`Reply from 2Ø8.132.18Ø.48: bytes=32 times=2ms TTL=32`

`C:\Program Files\Extron`

Variables are written in slanted form as shown here:

`ping xxx.xxx.xxx.xxx –t`

`SOH R Data STX Command ETB ETX`

Selectable items, such as menu names, menu options, buttons, tabs, and field names are written in the font shown here:

From the **File** menu, select **New**.

Click the **OK** button.

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Contents

Introduction

This section describes:

- **About This Guide**
- **About the Switcher**
- **Features**

About This Guide

This manual contains installation, configuration, and operating information for the Extron ISM 482 Integration Scaling Matrix Switcher.

In this manual, the terms "switcher" and "ISM" are used interchangeably to refer to the ISM 482.

About the Switcher

The ISM 482 is an eight-input, two-independently-scaled-output, video and stereo or mono audio matrix switcher. **Figure 1** on the next page shows a typical ISM 482 application. The switchers accept high resolution RGB video, YUV (component) video, S-video (Y/C), and composite video inputs; scale the inputs; and output RGBHV or RGBS video and stereo audio. Triple-Action Switching™ (RGB delay) blanks the screen during the switch to prevent distracting video glitches. The switcher's two independent scalers permit differing video formats on each input to be displayed in different resolutions on different projectors.

Each video input is individually configurable to allow for different video formats. The ISM allows analog RGBHV, RGBS, RGsB, and RGBcvS video, component video, S-video, and composite video signals to be displayed on a device with a fixed resolution and aspect ratio, such as a liquid crystal display (LCD) projector, digital light processor (DLP) projector, or plasma display.

The ISM provides two separate outputs. The selected input can be switched to either or both outputs. With an optional DVI output card, the ISM converts the scaled image to DVI as an additional set of output 1 signals.

The switcher inputs all valid video signal formats on eight sets of five BNC connectors. The ISM 482 scales the input up or down to a wide variety of output resolutions and rates. The switcher outputs the scaled video, as RGBHV or RGBS, on two sets of output connectors, consisting of five BNCs and a 15-pin HD connector. These connectors share identical outputs.

Several of the output resolutions and rates include the Extron Accu-RATE Frame Lock™ (AFL™), a proprietary technology that locks the output frame rate to the refresh rate of input 1, solving the image tearing problem that can result from different input and output rates. The switcher features HDTV 576p, 720p, 1080p, and 1080i outputs.
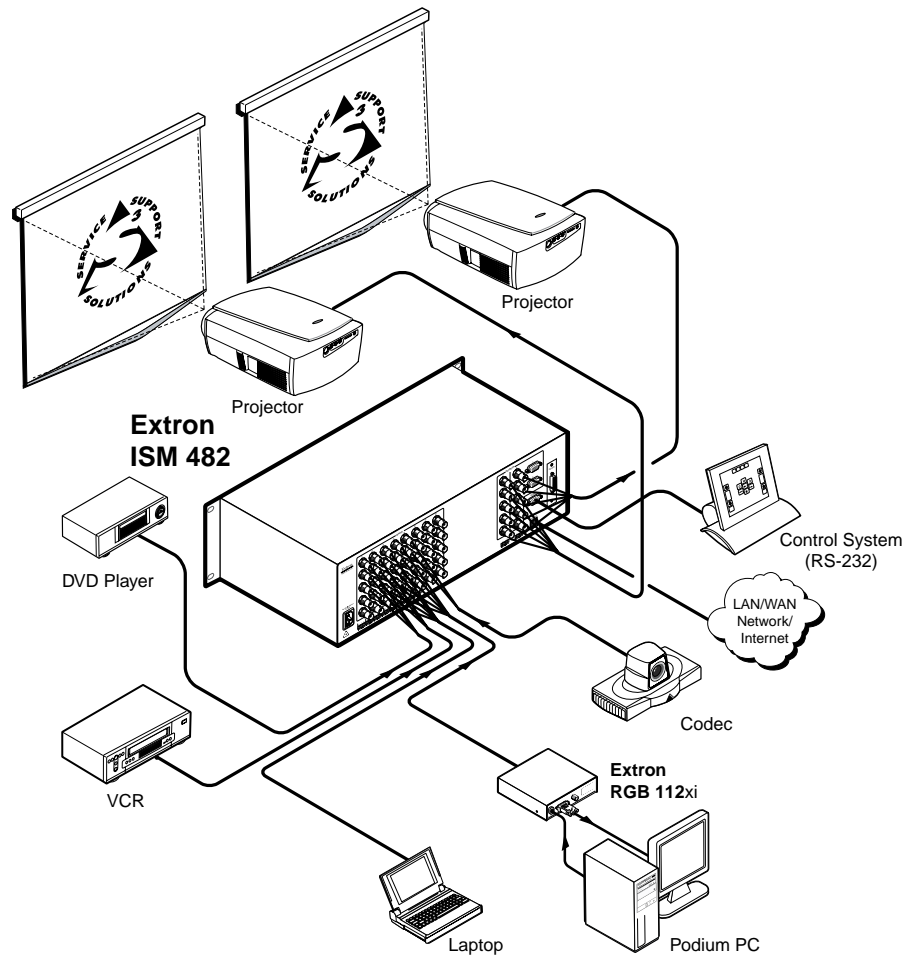
Figure 1. **Typical ISM 482 Integration Scaling Matrix Switcher Application**

The ISM receives and outputs the stereo audio on 5-pole captive screw connectors.

For upscaling, the ISM 482 converts the horizontal and vertical sync timing and the number of lines of the lower-resolution video input to match the native resolution of the display. This produces an undistorted, brighter picture than an unscaled input would.

For downscaling, the ISM 482 accepts any computer resolution, up to 1600 x 1200, with horizontal scan rates up to 100 kHz and vertical scan rates up to 120 Hz, and converts the input to match the native resolution of the display.

The switcher is ideal for displaying images on projectors with limited display resolutions, such as LCD projectors, DLP projectors, and plasma projectors.

The switcher features built-in test patterns to aid in monitor or projector set-up and evaluation.

The switcher is housed in a rack-mountable, 3U high, 17.5 inch wide, metal enclosure. The ISM has an internal 100VAC to 240VAC, 50/60 Hz, 30 watts power supply that provides worldwide power compatibility.

Features

- **Inputs**
  - **Video inputs** — The ISM switches among eight fully-configurable RGB, HDTV component video, component video, S-video, and composite video inputs on five BNC connectors per input.
  - **Audio inputs** — The ISM switches among eight balanced or unbalanced stereo or mono audio inputs on 5-pole captive screw connectors.
- **Outputs**
  - **Standard video outputs** — The ISM outputs individually scaled video signals as RGBHV or RGBS. Two sets of BNC connectors and two 15-pin HD connectors are provided. One set of BNC connectors and one 15-pin HD connector display the output 1 image, and the other set of BNC connectors and 15-pin HD connector display the output 2 image.
  - **Optional DVI video output** — If you install the optional DVI output card, a single buffered DVI-D signal can be output as an additional output 1 image.

    > **NOTE:** For output resolutions with less than 1024 pixels horizontally, the optional DVI output's true horizontal resolution is limited to 1024 pixels. For the 1365 x 1024, 1080p, and 1080i output resolutions, the optional DVI output's true horizontal resolution is limited to 1280 pixels. The DVI card outputs all other selected resolutions normally (see the table on page 20).

  - **Audio outputs** — The ISM outputs the selected unamplified, line level, balanced or unbalanced stereo or mono audio on 5-pole captive screw connectors.
- **Accu-RATE Frame Lock™ (AFL™)** — A patented technology exclusive to Extron that solves frame rate conversion issues experienced by video scalers. When video input and output refresh rates differ, occasionally the two rates cross over each other. The result is a glitch or image freeze on the display. AFL solves this problem by locking the output frame rate to the frame rate of input 1.
- **Dynamic Motion Interpolation™ (DMI™)** — This video processing technique is an advanced motion prediction and compensation method that treats motion content and still content with different algorithms to yield high fidelity images.
- **3:2 pulldown detection for NTSC video sources and 2:2 film detection for PAL** — These advanced, patent pending, film mode processing features help maximize image detail and sharpness for video sources that originated from film. When film is converted to NTSC video, the film frame rate has to be matched to the video frame rate in a process called 3:2 pulldown. Jaggies and other image artifacts can result if conventional deinterlacing techniques are used on film-source video. The ISM's advanced film mode processing recognizes signals that originated from film. The ISM then applies video processing algorithms that optimize the conversion of video that was made with the 3:2 pulldown process. This results in richly detailed images with sharply defined lines.

  A similar process, 2:2 film detection, is used for PAL film-source video.
- **Audio follow and breakaway** — Audio switching can follow its corresponding video input signal or it can be broken away from the video input. Audio breakaway switching can be done via front panel control or under RS-232 or Ethernet remote control.
- **Audio gain/attenuation** — Users can set the input level of audio gain or attenuation (-24 dB to +9 dB) via the RS-232 port, Ethernet link, or from the front panel. Individual input audio levels can be adjusted so there is no noticeable volume difference between sources.

- **Ethernet port** — Supports connection to an Ethernet LAN so that the switcher can be accessed and operated from anywhere in the world with a computer using a standard Internet browser.

- **Quad-standard video decoder** — The switcher uses a digital, four-line adaptive comb filter that can decode NTSC 3.58, NTSC 4.43, PAL, and SECAM.

- **Test patterns** — The switcher features built-in test patterns to aid in monitor or projector setup and evaluation.

- **Blue mode** — The switcher can be set to output the blue video signal and sync signal(s) only, to help installers calibrate the monitor or projector.

- **Triple-Action Switching™ (RGB delay)** — RGB delay mutes the R, G, and B video planes to blank the screen while the scaler locks to the new sync, so that a noise-filled scramble is not shown on the monitor during the transition. The time delay between the RGB and sync signals is user adjustable up to five seconds under front panel, Simple Instruction Set (SIS™), and Windows program control.

- **Auto memories** — The eight inputs support 16 auto-recall memories each, based on the incoming frequency. Information on sizing, centering, detail, contrast, and brightness is saved.

- **Auto Image™** — The auto imaging feature automatically sizes and centers the selected input to fill the screen. Auto imaging can be manually initiated on the current input, or can be enabled to globally size and center each new input signal automatically.

- **Memory presets** — The ISM 482 has memory for up to 128 presets that allow the user to use RS-232 commands to save and recall color, tint, contrast, brightness, centering, sizing, and filtering information.

- **Aspect ratio memories** — Three memories for each input save different color, tint, contrast, brightness, detail, size, and centering settings.

- **Freeze mode (under SIS and Windows program control only)** — Locks the output display to the selected image. Once frozen, an input can be removed without losing the output image. This feature lets the ISM store a still image.

- **Rack mounting** — The 3U high switcher can be mounted in any conventional 19 inch wide rack.

Installation

This section describes:

- **Mounting the Switcher**
- **Cabling and Rear Panel Views**
- **Configuration**

Mounting the Switcher

Four uninstalled rubber feet are included with the switcher. If you are going to rack mount the switcher, mount it before you cable it (see "Rack Mounting," below), and do not install the rubber feet. If you are not rack mounting the switcher, see "Tabletop Pacement," below.

Tabletop Placement

For tabletop placement, install the self-adhesive rubber feet/pads (provided) onto the four corners of the bottom of the switcher.

Rack Mounting

UL guidelines

The following Underwriters Laboratories (UL) requirements pertain to the installation of the switcher into a rack (see figure 2 on the next page).

- **Elevated operating ambient temperature** — If the equipment is installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient temperature. Therefore, install the switcher in an environment compatible with the maximum ambient temperature (Tma = +122 °F, +50°C) specified by Extron.
- **Reduced air flow** — Install the equipment in a rack so that the amount of air flow required for safe operation of the equipment is not compromised.
- **Mechanical loading** — Mount the equipment in the rack so that a hazardous condition is not achieved due to uneven mechanical loading.
- **Circuit overloading** — Connect the equipment to the supply circuit and consider the effect that circuit overloading might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- **Reliable earthing (grounding)** — Maintain reliable grounding of rack-mounted equipment. Pay particular attention to supply connections other than direct connections to the branch circuit (that is, use of power strips).

Mounting instructions

To rack mount the switcher, use two screws on each end of the switcher to attach the switcher to the rack (see figure 2).
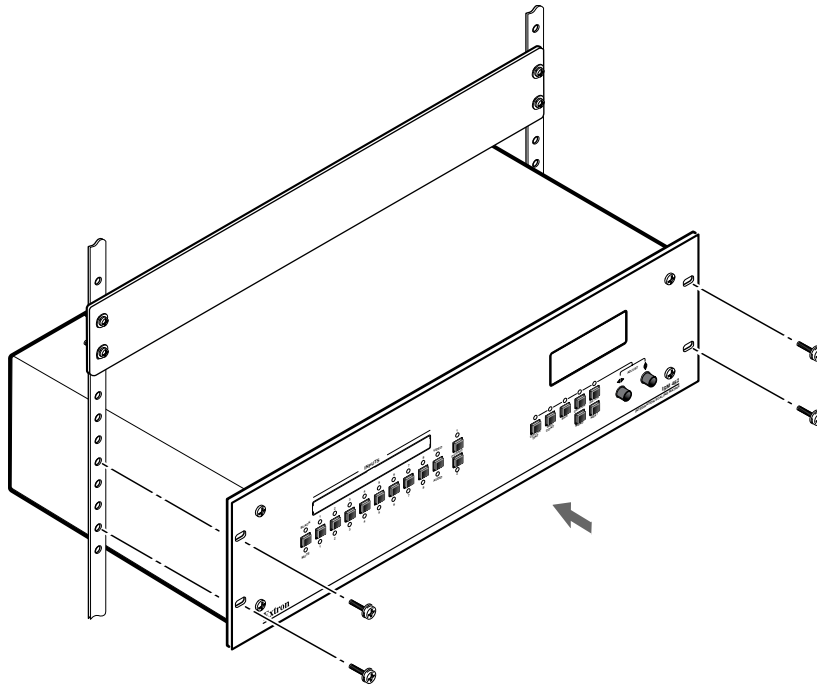
Figure 2.   Mounting the Switcher

Cabling and Rear Panel Views

All connectors are on the rear panel (see figure 3).
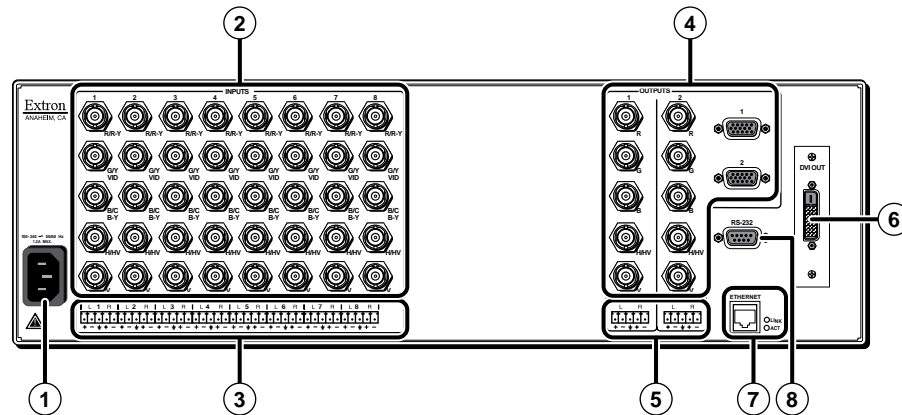
Figure 3.   ISM 482 Rear Panel Connectors

Input Connections

① **AC power connector** — Plug a standard IEC power cord into this connector to connect the switcher to a 100 to 240 VAC, 50 Hz or 60 Hz power source.

② **Input video connectors** — Connect computer or RGB video, component video, S-video, or composite video sources to these female BNC connectors. Figure 4 on the next page shows how to connect the various video formats.
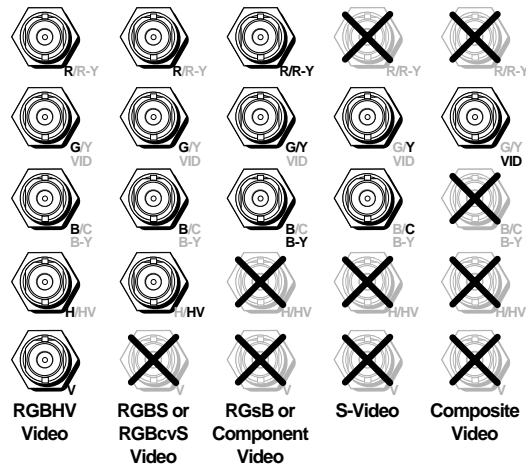
Figure 4. Connections for Various Input Video Formats

③ **Input audio connectors** — Connect balanced or unbalanced stereo or mono audio sources to these 3.5 mm, 5-pole captive screw connectors. Connectors are included with the seamless switcher, but you must supply the audio cable. Figure 5 shows how to wire a connector for the appropriate input type.
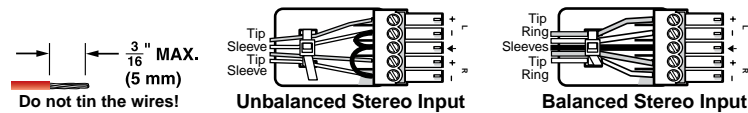
Figure 5. Captive Screw Connectors Wiring for Inputs

ATTENTION: The length of exposed wires is critical. The ideal length is 3/16 inch (5 mm).

- If the stripped section of wire is longer than 3/16 inch, the exposed wires may touch, causing a short circuit between them.
- If the stripped section of wire is shorter than 3/16 inch, wires can be easily pulled out even if tightly fastened by the captive screws.

NOTE: When making connections for the seamless switcher from existing audio cables, see figure 6. A mono audio connector consists of the tip and sleeve. A stereo audio connector consists of the tip, ring and sleeve. The tip, ring, and sleeve wires are also shown on the captive screw audio connector diagram, figure 5.
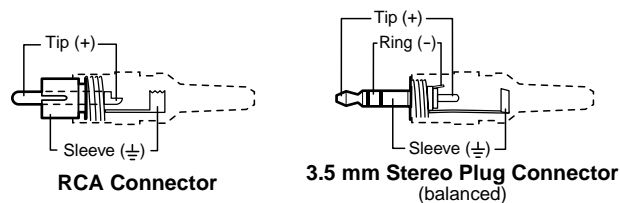
Figure 6. Phono Audio Connectors

The audio level for each input can be individually set, via the front panel, the Ethernet link, or the RS-232 link, to ensure that the level on the output does not vary from input to input. See the applicable portions of the **Operation** section (see page 17), **Programming Guide** section (see page 42), and **Switcher Software** section (see page 54).

Standard Output Connections

> **NOTE:** The two Output 1 outputs, consisting of five BNC connectors and a 15-pin HD connector, output the identical video signal and the same sync format. The two Output 2 outputs are also identical to each other.

④ **Video output BNC connectors** — Connect RGB video displays to these two sets of female BNC connectors. Figure 7 shows how to connect the various video formats.
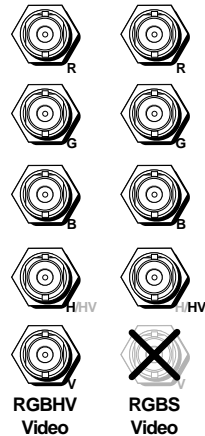
Figure 7.   **BNC Output Connections for RGBHV and RGBS Video**

Video output 15-pin HD connectors — Connect RGB video displays to these two female 15-pin HD connectors.

⑤ **Audio output connectors** — Connect audio devices, such as an audio amplifier or powered speakers, to these two 3.5 mm, 5-pole captive screw connectors. The connectors output the selected unamplified, line level audio. See figure 8 to properly wire an output connector.
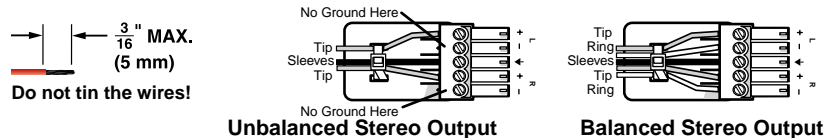
Figure 8.   **Captive Screw Connector Wiring for Audio Output**

> **ATTENTION:**
> - Connect the sleeve to ground (Gnd). Connecting the sleeve to a negative (-) terminal will damage the audio output circuits.
> - The length of exposed wires is critical. The ideal length is 0.2 inches (5 mm).
>   - If the stripped section of wire is longer than 0.2 inches, the exposed wires may touch, causing a short circuit between them.
>   - If the stripped section of wire is shorter than 0.2 inches, wires can be easily pulled out even if tightly fastened by the captive screws.

By default, the audio output follows the video switch. Audio breakaway, commanded via the front panel, the Ethernet link, or the RS-232 link, allows you to select from any one of the audio input sources. See the applicable portions of the **Operation** section (see page 12), **Programming Guide** section (see page 38), **Switcher Software** section (see page 50), and **HTML Operation** section (page 55).

Optional Output Connection

⑥ **DVI output connector (optional)** — If the optional DVI output card is installed, connect a DVI/DFP-compatible video display to this DVI connector. This connector outputs the image selected for output 1 only.

> **NOTE:** For output resolutions with less than 1024 pixels horizontally, the optional DVI output's true horizontal resolution is limited to 1024 pixels. For the 1365 x 1024, 1080p, and 1080i output resolutions, the optional DVI output's true horizontal resolution is limited to 1280 pixels. The DVI card outputs all other selected resolutions normally (see the table on page 20).

Ethernet Connection

⑦ **Ethernet port** — If desired, connect the switcher to an Ethernet LAN or WAN via this RJ-45 connector. Ethernet control allows the operator to control the switcher from a remote location. When connected to an Ethernet LAN or WAN, the switcher can be accessed and operated from a computer running a standard Internet browser.

Ethernet connection indicators — The Link and Act LEDs indicate the status of the Ethernet connection.

The Link LED indicates that the switcher is properly connected to an Ethernet LAN. This LED should light steadily.

The Act LED indicates transmission of data packets on the RJ-45 connector. This LED should flicker as the switcher communicates.

Cabling and RJ-45 connector wiring

It is vital that your Ethernet cables be the correct cables, and that they be properly terminated with the correct pinout.

Choosing a network cable

Ethernet links use Category (CAT) 3, 4, 5, 5e, or 6, unshielded twisted pair (UTP) or shielded twisted pair (STP) cables, terminated with RJ-45 connectors. Ethernet cables are limited to 328 feet (100 m).

> **NOTES:**
> - Do not use standard telephone cables. Telephone cables will not support Ethernet or Fast Ethernet.
> - Do not stretch or bend cables. Transmission errors can occur.

The cable used depends on your network speed. The ISM supports both 10 Mbps (10Base-T — Ethernet) and 100 Mbps (100Base-T — Fast Ethernet), half-duplex and full-duplex, Ethernet connections.

- 10Base-T Ethernet requires, at a minimum, CAT 3 UTP or STP cable.
- 100Base-T Fast Ethernet requires, at a minimum, CAT 5 UTP or STP cable.

Wiring the network cable

The cable can be terminated as either a patch cable or a crossover cable (see figure 9) and must be properly terminated for your application:

- **Patch (straight) cable** — Connection of the ISM to an Ethernet hub, router, or switcher that also hosts a controlling computer

- **Crossover cable** — Direct connection between the ISM and a controlling computer

Pins:
12345678

Insert Twisted
Pair Wires

**RJ-45
Connector**

Crossover Cable

Pin	End 1 Wire color	End 2 Wire color
1	White-green	White-orange
2	Green	Orange
3	White-orange	White-green
4	Blue	Blue
5	White-blue	White-blue
6	Orange	Green
7	White-brown	White-brown
8	Brown	Brown
T568A		**T568B**

A cable that is wired as T568A at one end and T568B at the other (Tx and Rx pairs reversed) is a "crossover" cable.

Straight-through Cable

Pin	End 1 Wire color	End 2 Wire color
1	White-orange	White-orange
2	Orange	Orange
3	White-green	White-green
4	Blue	Blue
5	White-blue	White-blue
6	Green	Green
7	White-brown	White-brown
8	Brown	Brown
T568B		**T568B**

A cable that is wired the same at both ends is called a "straight-through" cable, because no pin/pair assignments are swapped.

Figure 9.   RJ-45 Connector Pinout Tables

RS-232 Connection

⑧ **Remote port** — Connect a host device, such as a computer or touch panel control, to the integration scaling matrix switcher via this 9-pin D connector for serial RS-232 control (see figure 10).

Pin	RS-232	Function
1	—	Not used
2	TX	Transmit data
3	RX	Receive data
4	—	Not used
5	Gnd	Signal ground
6	—	Not used
7	—	Not used
8	—	Not used
9	—	Not used

5   1

9   6
Female

1   5

6   9
Male
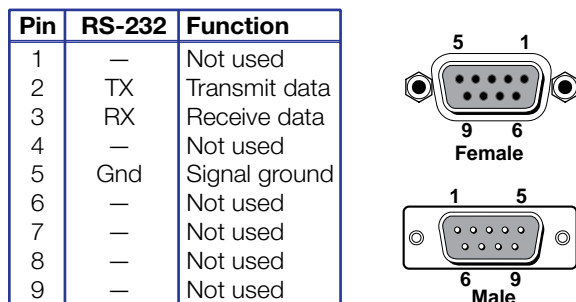
Figure 10.   Remote Port Pin Assignments

See **Programming Guide** on page 31, for definitions of the SIS commands and **Switcher Software** on page 47, to install and use the control software.

Configuration

The ISM can be configured using either the front panel controls, the SIS, or the Windows Control program (see the **Operation** section on page 16, the **Programming Guide** section on page 38, the **Switcher Software** section on page 49, and the **HTML Operation** section on page 60

Operation

This section describes:

- **Front Panel Controls and Indicators**
- **Front Panel Operations**
- **Optimizing the Video**
- **Optimizing the Audio**
- **Troubleshooting**

Front Panel Controls and Indicators

All of the switcher's controls and indicators are on the front panel (see figure 11). A label window above the input buttons can be labeled with text and/or graphics. The 20 x 4 LCD display indicates the switcher status, menu selections, the data rate, and the status of additional system features.
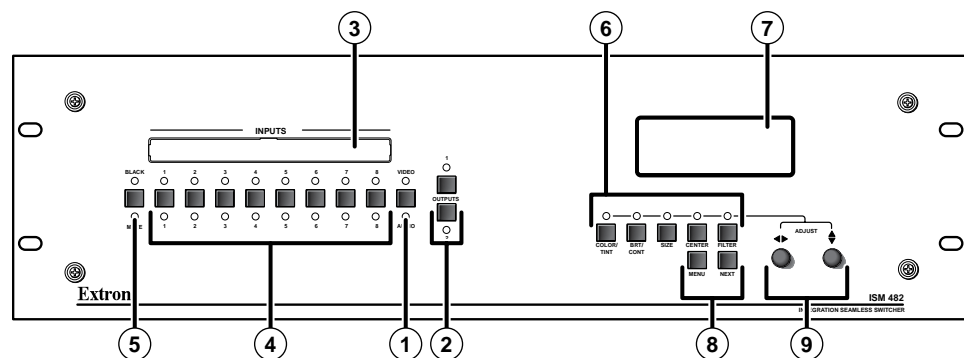
Figure 11. **Integration Scaling Matrix Switcher Front Panel**

Video/Audio Selection Button and LEDs

① **Video/Audio button —** The Video/Audio button selects video, audio, or video and audio for creating ties. If neither is selected, no ties can be created.

Video and Audio LEDs — The green Video LED and red Audio LED indicate whether video, audio, video and audio, or neither will be selected using the Input buttons and indicated by the Input LEDs (④).

Figure 12 shows the sequence displayed by the LEDs when you cycle through video and/or audio selection by pressing the Video/Audio button repeatedly as follows.
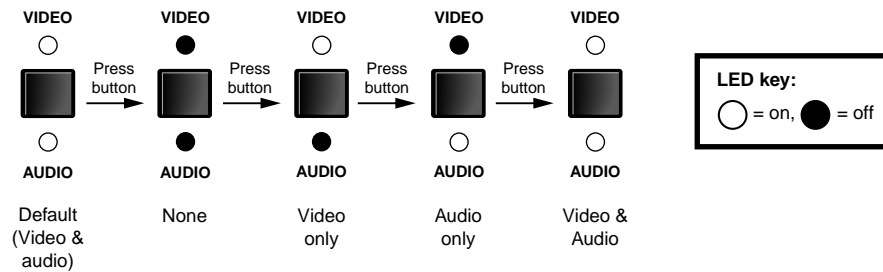
Figure 12.   Video and/or Audio Selection Cycle

Output Buttons and LEDs

② **Output 1 and Output 2 buttons —** The Output 1 and Output 2 buttons select output 1 or output 2. Press an output button to select that output and automatically deselect the other output (see figure 13).

Output 1 and 2 LEDs — The Output 1 and Output 2 LEDs indicate the output that is selected (see figure 13). Only one Output LED can be lit at a time.

> **NOTE:**   Only one of the two outputs can be selected at a time.
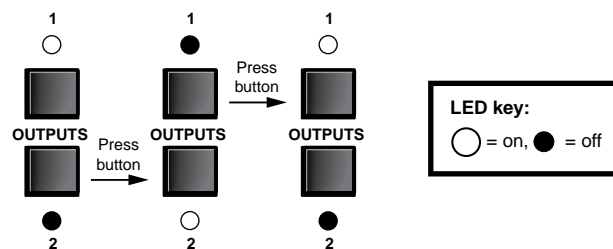
Figure 13.   Output Selection Cycle

When an output is selected, its tied input is indicated by the associated Input LED. You can select a different input to tie to this output by pressing the desired input button.

Input Buttons, LEDs, and Label Window

Front panel input label window

③ **Input label panel —** This translucent panel can be removed and replaced to insert a label behind the panel. To remove the panel, insert the Phillips-head end of an Extron tweeker or small Phillips-head screwdriver into the hole in one end of the panel, and gently slide the tab on the edge of the panel out of the recess in the switcher housing.

Input labels can be created easily with Extron's button label generator software, which is shipped with every Extron Matrix Switcher, or with any Brother® P-Touch™ labeler. Each input can be labeled with names, alphanumeric characters, or even color bitmaps for easy and intuitive input and output selection (see figure 14). See the **Button-Label Generator** section on page 51 for details on using the label software and the **Button Labels** section on page 75 for blank labels.
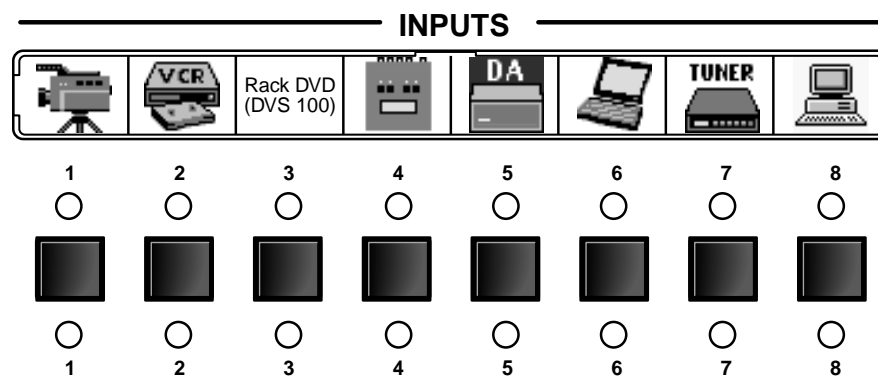
Figure 14.   Sample Label

Selecting an input

④ **Input selection buttons —** The Input 1 through Input 8 buttons select the associated input to scale and display on the selected outputs.

Input selection LEDs — The green input LEDs above the input buttons indicate the video selection. The red input LEDs below the input buttons indicate the audio selection. To view the input tied to the unselected output, press the unselected output button. Both outputs' input selections can also be viewed in the LCD display cycle.

Recalling a user preset

There are three user presets per input. The presets save color, tint, contrast, brightness, detail, sizing, and centering settings. See **User Presets menu** on page 23 to save and erase presets. Cycle through and recall these memories by repeatedly pressing the appropriate input button. The LCD panel identifies the recalled preset (see figure 15).
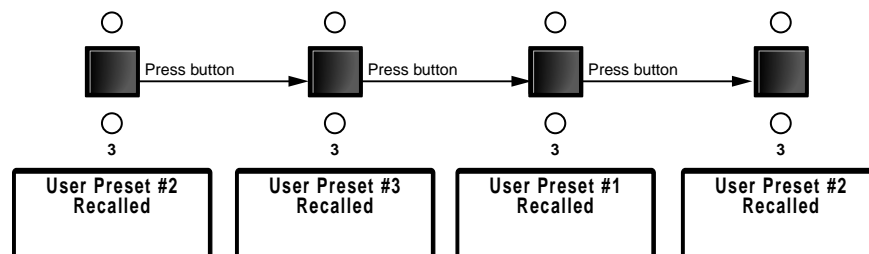
Figure 15.   Recalling User Presets

Auto imaging an input

The auto imaging feature automatically sizes and centers the selected input to fill the screen. Initiate the auto imaging feature for a specific input by pressing and **holding** the appropriate input button until the LCD displays the message **Auto Image Input #n**, releasing the input button, and then pressing and releasing the input button again. The LCD displays **AutoSizing and Centering Please Wait...** until the operation is complete.

Alternatively, using the menu system, you can set this feature to apply the Auto Image adjustments to every input as it is selected (see **Auto Imaging and Auto Memories submenu** on page 22).

Black/Mute Button and LEDs

⑤ **Black/Mute button and LEDs —** The Black/Mute button switches the selected output(s) to a black screen and/or muted audio. The black screen and/or mute audio is deselected when a new input is selected.

Picture Adjustment Buttons

⑥ The picture adjustment buttons select individual image adjustments that are adjusted using the Adjust ◄► and Adjust ↕ knobs (⑨). The LEDs above these buttons light when the button is pressed (see **Picture Adjustments** on page 25).

Color/Tint control button — The Color/Tint button selects the display color and tint adjustments. The color adjustment range is from 0 to 127. The tint adjustment range is from 0 to 255.

> **NOTE:**   The Color/Tint control affects only composite video and S-video inputs.

Brightness/Contrast control button — The Brightness/Contrast button selects the display brightness and contrast adjustments. The adjustment range for both brightness and contrast is from 0 to 63.

Size control button — The Size button selects the display size adjustment. The adjustment range depends on the output resolution selected.

Center control button — The Center button selects the display centering adjustment. The adjustment range depends on the output resolution selected.

Filter control (Detail) button — The Detail button selects the display image detail (sharpness) adjustment. There are separate horizontal and vertical filters for RGB and component video. There is a single filter for S-video and composite video. The sharpness adjustment compensates for long cable runs.

- For RGB and component video, the Adjust ◄► knob controls the horizontal filter and the Adjust ↕ knob controls the vertical filter. The adjustment range for the horizontal filter is from 0 to 3. The adjustment range for the vertical filter is from 0 to 7.

- For S-video and composite video, either Adjust knob controls the filter setting. The range of the adjustment is from 0 to 7.

LCD Display

⑦ **Status display —** The 20-column by 4-line LCD displays configuration menus and status information (see "Front Panel Operations," below, for details).

Menu Control Buttons

⑧ Menu button — The Menu button enters and moves through the main menu system in the ISM (see "Front Panel Operations," below, for details).

Next button — The Next button steps through the submenus in the ISM menu system (see "Front Panel Operations," below, for details).

Adjustment Knobs

⑨ **Adjust ◂▸ (horizontal) and Adjust ↕ (vertical) knobs —** The Adjust ◂▸ and Adjust ↕ knobs change settings when used in conjunction with the picture adjustment buttons or the menu system. Rotate these knobs to change picture settings when one of the picture adjustment buttons is selected. In the menu system, rotate these knobs to scroll through the selection options and make adjustments.

Front Panel Operations

The following paragraphs detail the power-up process and then describe the menu system, the picture adjustments, and selection of executive mode.

Power

Power is automatically applied when the power cord is connected to an AC source. When AC power is applied, the switcher performs a self-test that blinks all of the front panel LEDs and then lights only the LEDs for the previously selected output and the tied input. The self-test also displays the model name, part number, and the firmware version in the LCD display. After approximately 2 seconds, the LCD reverts to its default display cycle, alternating between two displays: one showing the inputs selected for outputs 1 and output 2, and the other showing the selected output rates (see figure 16). An error-free power up self-test sequence leaves all of the LEDs off, with the exception of the selected output's and input's LEDs, off and the LCD cycling through the default displays.
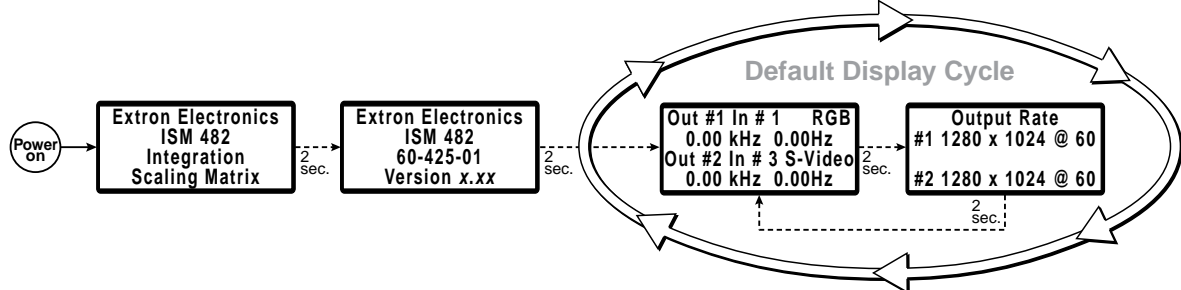
Figure 16. LCD Power Up and Default Display Cycle

The selected inputs for output 1 and output 2, the picture adjustments, and other current settings are saved in nonvolatile memory. When power is applied, the latest configuration is retrieved.

NOTE: On figure 16 and all other flowcharts in this section, solid lines indicate screen changes initiated by the operator. Dashed lines indicate screen changes that are the result of a timeout function.

Menu System Overview

Figure 17 shows a flowchart of the main menus in the menu system.
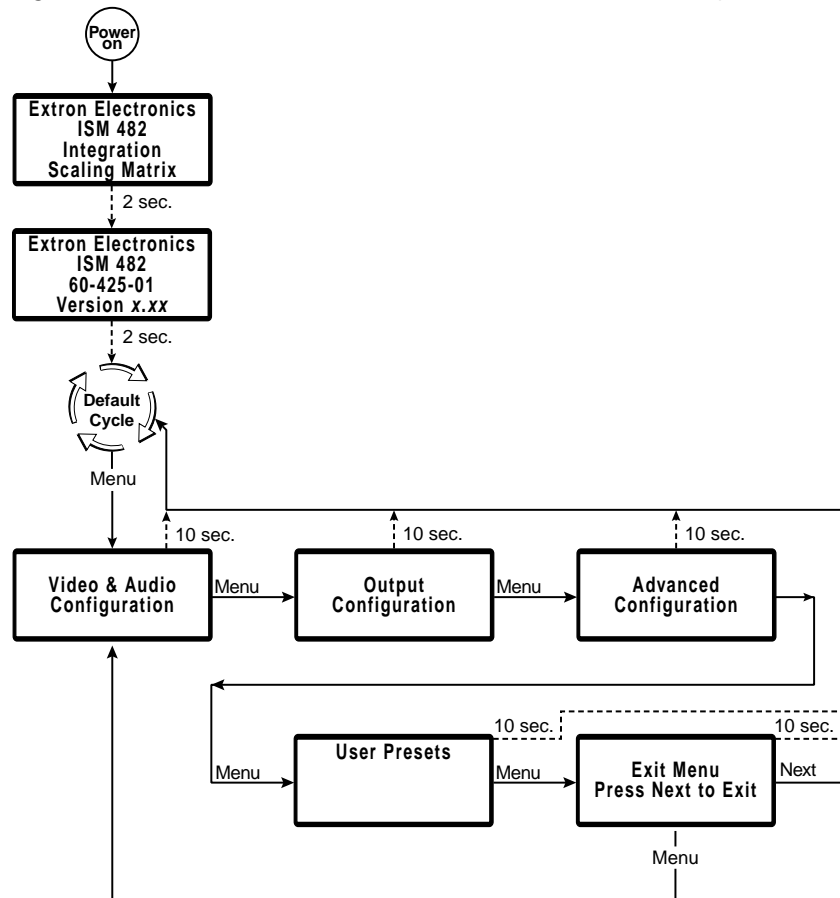
Figure 17. **Menu system flowchart**

- **Menu button** — Press the Menu button to activate the menu system and to scroll through the five main menus.

- **Next button** — Press the Next button to move between the submenus of a selected main menu, to activate one for viewing or configuration, and to save a selection. Pressing the Next button during input configuration causes the current input's number and format type to be displayed on the LCD.

- **Adjust ◄► and Adjust ↕ knobs** — When a submenu is active, rotate the Adjust ◄► knob and Adjust ↕ knob to scroll through the submenu options and select a setting. Refer to the menu descriptions and flowcharts in this section for specific menu control explanations.

> **NOTES:**
> - If you press the Menu button while a main menu or a submenu is active, the next main menu becomes active. For example, the display changes from the Video & Audio Configuration main menu or the Input Configuration submenu (a submenu of the Video & Audio Configuration menu) to the Output Configuration main menu.
>
> - To return to the default screens, let the switcher remain idle for 10 seconds until the selected screen times out; or press the Menu button until the Exit Menu appears, then press the Next button.
>
> - From any menu or submenu, after 10 seconds of inactivity, the ISM saves all adjustment settings and times out to the default LCD display cycle.

Video & Audio Configuration menu

Figure 18 is a flowchart that shows an overview of the Video & Audio Configuration menu and the available settings.
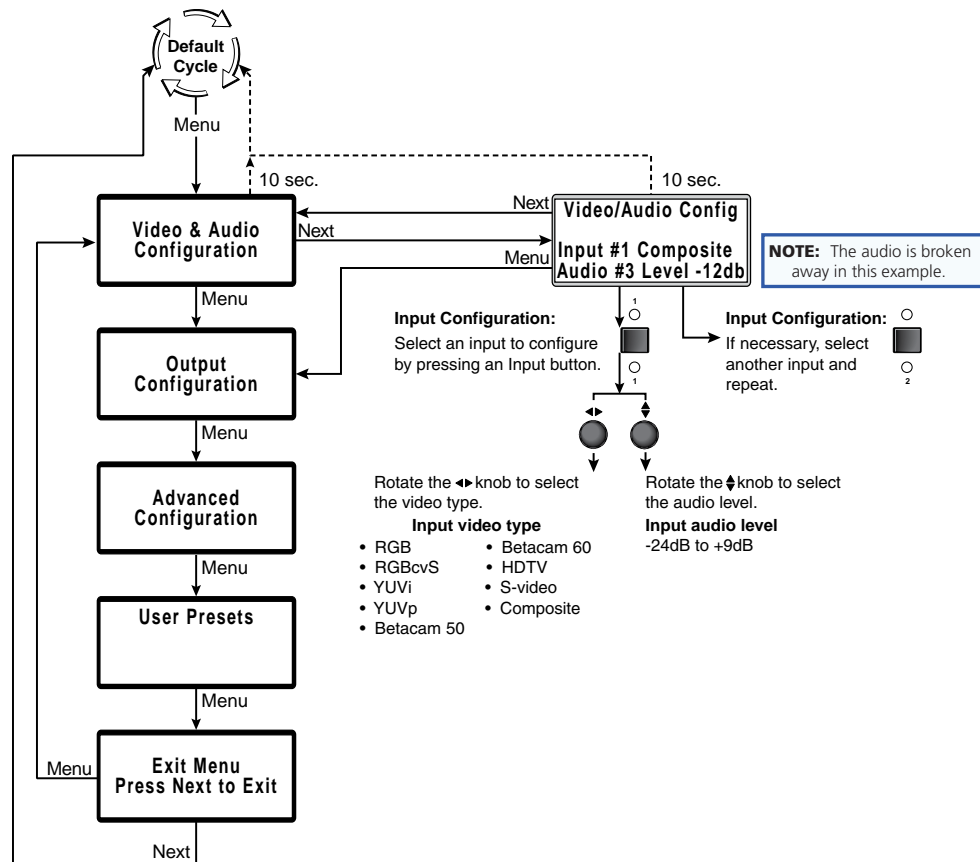
Figure 18.   Video and Audio Configuration Menu Flowchart

Input Configuration submenu

Select an input to configure by pressing and releasing an input button. Rotate the Adjust ◄► knob while in the Input Configuration submenu to select the correct video format (RGB, RGBcvS, YUVi, YUVp, Betacam 50, Betacam 60, HDTV, S-video, or composite video) for the selected input. Rotate the Adjust ♦ knob to select the audio gain or attenuation value, from -24 dB to +9 dB. The defaults for each input are RGB video and a 0 dB audio level.

Output Configuration menu

Figure 19 is a flowchart that shows an overview of the Output Configuration menu, the submenus, and the available settings.

Figure 19. Output Configuration Menu Flowchart

Output Resolution submenu

Select the output whose resolution and refresh rate you want to set by pressing the desired Output button.

Rotate the Adjust ◄► knob while this submenu is active to select one of the available output resolutions.

Rotate the Adjust ⬍ knob while this submenu is active to select one of the available refresh (vertical scanning) rates. Selecting Lock enables the Extron Accu-RATE Frame Lock (AFL) feature. Accu-RATE Frame Lock eliminates image tearing and other artifacts of scaling motion video by eliminating frame rate conversion. It exactly matches the output rate of the ISM to the frame rate of input 1. Select this feature if you will be using motion video sources with a display that is capable of a variety of refresh rates. AFL is compatible with 50 Hz and 60 Hz only.

The default resolution and rate is 1024 x 768 @ 60 Hz.

If you need to set the resolution and refresh rate on the other output, press the other output button. You do not need to exit this submenu.

Resolution	50 Hz	56 Hz	60 Hz	75 Hz	85 Hz	Lock at 50/60 Hz†	Actual DVI output
640 x 480	●		●	●		●	1024 x 480
800 x 600	●		●	●		●	1024 x 600
832 x 624			●	●		●	1024 x 624
848 x 480			●			●	1024 x 480
852 x 480			●			●	1024 x 480
1024 x 768*	●		●	●	●	●	1024 x 768
1280 x 768*	●	●	●			●	1280 x 768
1200 x 800*	●		●			●	1200 x 800
1280 x 1024*	●		●				1280 x 1024
1360 x 765*			●			●	1360 x 765
1365 x 768*	●		●			●	1365 x 768
1366 x 768*			●			●	1366 x 768
1365 x 1024			●			●	1280 x 1024
1400 x 1050*	●		●			●	1400 x 1050
576p HDTV*	●					●	720 x 576
720p* HDTV @ 60 Hz only			●			●	1280 x 720
1080p HDTV @ 60 Hz only			●			●	1280 x 1080
1080i HDTV	●		●			●	1280 x 540

* Native DVI output resolution
† The output refresh rate is auto-selected, based on the video refresh rate of input 1.

> **NOTES:**
> - For output resolutions with less than 1024 pixels horizontally, the optional DVI output is limited to a true horizontal resolution of1024 pixels. The vertical resolution is the selected vertical resolution. For these resolutions, the ISM DVI output is 1024 x {selected vertical size}. For example, if the output resolution is set to 640 x 480, the DVI output card's actual resolution is 1024 × 480.
> - For the 1365 x 1024, 1080p, and 1080i output resolutions, the optional DVI output is limited to a true horizontal resolution of 1280 pixels. For these resolutions, the ISM DVI output is 1280 x {selected vertical size}. For example, if the output resolution is set to 1080p, the DVI output card's actual resolution is 1280 x 1080.
> - The DVI card outputs all other selected resolutions normally.
> - Resolutions marked with an asterisk (*) in the table above are native DVI outputs; the DVI output fully supports the selected horizontal and vertical resolution. The DVI output resolution for these rates exactly matches the analog resolution.

Sync Type and Polarity submenu

Select the output whose sync type and polarity you want to set by pressing the desired Output button.

Rotate the Adjust ◂▸ knob while in this submenu to select the output video type (RGBHV or RGBS) for the selected output.

The display or projector may require a particular combination of horizontal (H) and vertical (V) sync signal polarities. Select the appropriate combination of positive or negative H and V sync for the selected output by rotating the Adjust ⬍ knob.

If you need to set the sync type and polarity on the other output, press the other output button. You do not need to exit this submenu.

Advanced Configuration Menu

Figure 20 is a flowchart that shows an overview of the Advanced Configuration menu, the submenus, and the available settings.
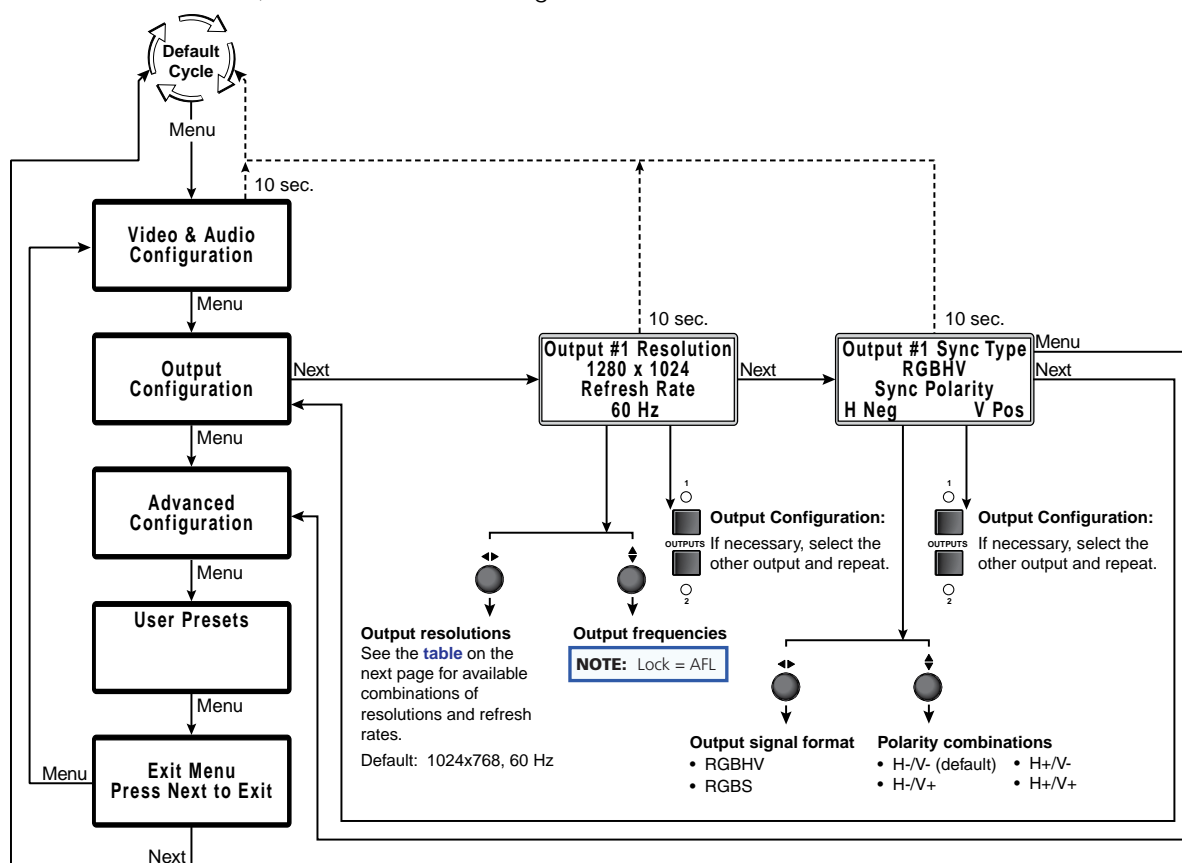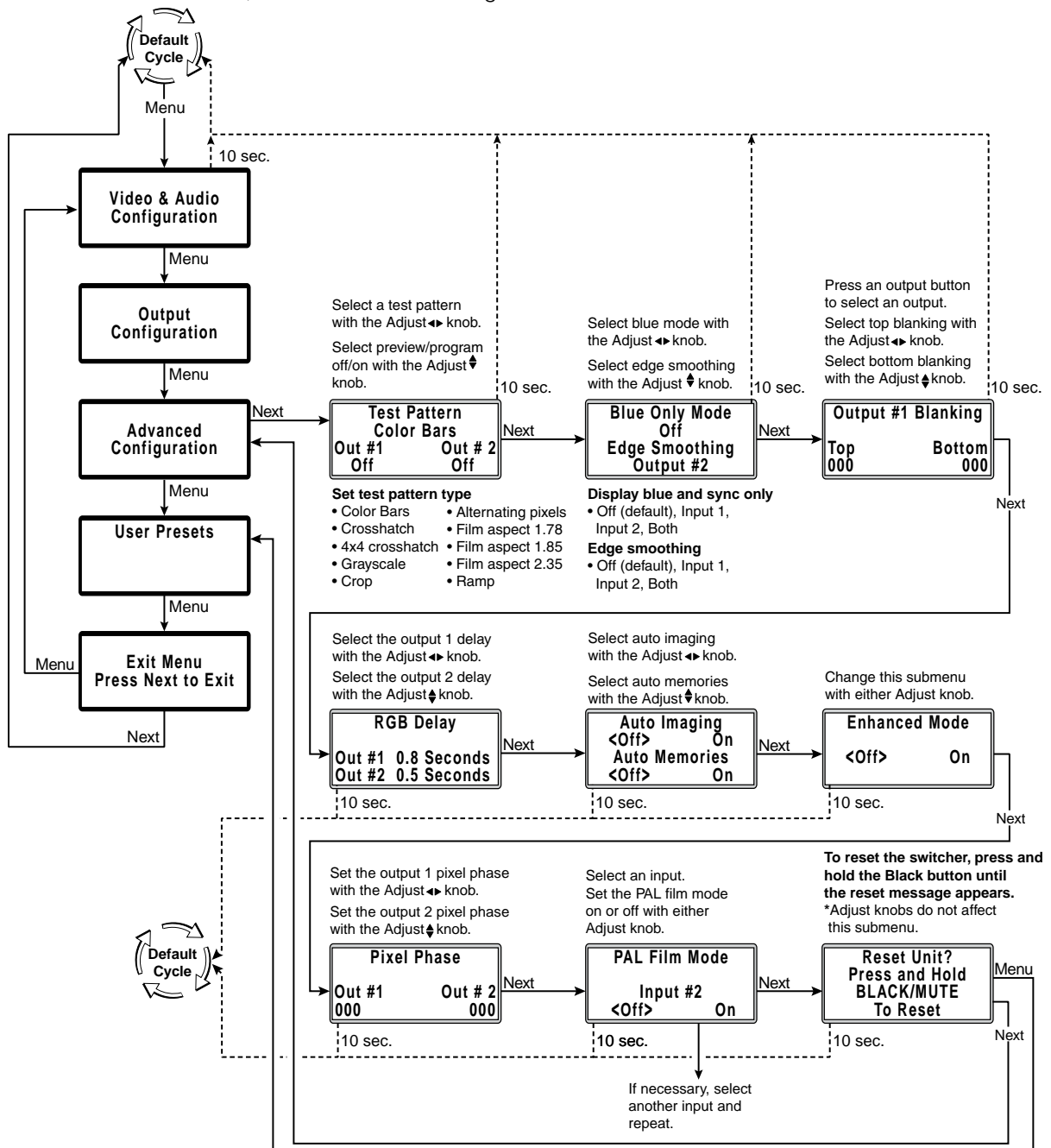

Figure 20. Advanced Configuration Menu Flowchart

Test Pattern submenu

The Test Pattern submenu lets you select from among several test patterns and assign the selected pattern to an output. The test patterns are helpful when adjusting the connected displays for color, convergence, focus, resolution, contrast, grayscale, and aspect ratio.

Use the Adjust ◄► knob to select a test pattern. The options are: Color Bars, crosshatch, 4 x 4 crosshatch, grayscale, crop, alternating pixels, film aspect ratios 1.78, 1.85, 2.35, and ramp.

Use the Adjust ↕ knob to assign the output(s) for the selected test pattern. Select among neither output (both off), output 2, output 1, or both outputs.

Blue-Only Mode and Edge Smoothing submenu

The Blue-Only Mode and Edge Smoothing submenu lets you turn the blue mode and edge smoothing features on and off. Blue-only mode is helpful in the setup of the color and tint of the incoming video signal. In the blue-only mode, only the sync and blue video signals are passed to the display. Edge enhancement mode smooths edges of a picture by minimizing the differences between pixels.

Use the Adjust ◄► knob to assign Blue-Only Mode to neither output (both off), output 2, output 1, or both outputs. The default is Off.

Use the Adjust ↕ knob to assign Edge Smoothing to neither output (both off), output 2, output 1, or both outputs. The default is Off.

Blanking submenu

The Output Blanking submenu displays and allows you to adjust the top and bottom line blanking on the output monitors within a range of 0 to 200 lines. During scaling, captioning and tapehead switching in the video's blanking area may show up as picture noise. Using blanking, you can add black lines at the top and bottom edges of the image to eliminate edge noise.

Select the output that you want to blank by pressing the desired Output button.

Use the Adjust ◄► knob to increase or decrease the top line blanking. The default is 0 lines.

Use the Adjust ↕ knob to increase or decrease the bottom line blanking. The default is 0 lines.

RGB Delay submenu

The RGB Delay submenu displays and lets you set the RGB delay when a switch is made. With RGB delay, sync is never removed from the display. Rather, the ISM blanks the RGB (video) outputs while the scaler locks to the new sync, and then switches the RGB signals. This allows a brief delay for the displays to adjust to the new sync timing before displaying the new picture, which appears without glitches. RGB delay is also known as Triple-Action Switching™ or video mute switching.

Use the Adjust ◄► knob to select the blanking period (RGB delay time) for output 1 from 0 seconds to 5 seconds in 0.1 second steps. The default is 0.2 seconds.

Use the Adjust ↕ knob to select the blanking period for output 2.

Auto Imaging and Auto Memories submenu

The Auto Imaging and Auto Memories menu provides a means to turn the auto imaging and auto presets features on or off globally.

If auto imaging is set to on, the ISM automatically sizes and centers the selected input to fill the screen when a new frequency is input. If auto imaging is set to off, the ISM automatically sizes and centers the selected input only when it is commanded using the input button (see **Auto imaging an input** on page 14). Rotate the Adjust ◄► knob to toggle auto imaging on or off for all input selections.

The auto memories feature saves and recalls centering and sizing information, based on the input frequency. With some control systems, the delay involved in recalling the memory can be a problem, so it may improve system performance to turn auto memories off. Rotate the Adjust ♦ knob to toggle auto memories on or off.

Enhanced Mode submenu

The Enhanced Mode submenu provides a means to turn enhanced mode on or off. Enhanced mode is an automatic gain control for S-video or composite video input signals scaled and applied to an output. If the input signal level is too weak, the signal gain is increased; if the input signal level is strong, the signal gain is decreased.

Use either the Adjust ◄► or Adjust ♦ knob to turn on enhanced mode for neither output (off for both), output 2, output 1, or both outputs. The default is Off for both.

> **NOTE:** Enhanced mode is effective only for S-video and composite video input signals.

Pixel Phase submenu

The Pixel Phase submenu displays and lets you set the pixel phase, which is the timing of the digital scaler's sampling. Sampling at the optimum pixel phase results in a brighter scaled output.

Use the Adjust ◄► knob to select the pixel phase for output 1 from 0 to 31. The default is 16.

Use the Adjust ♦ knob to select the pixel phase for output 2.

PAL Film Mode submenu

The PAL Film Mode submenu lets you turn PAL film mode on and off for the selected input. The PAL film mode should be used for a video source that is PAL video that originated from film. PAL film mode applies video processing algorithms that optimize the conversion of video that was made with the 2:2 pulldown (PAL video from film) process.

Use either the Adjust ◄► knob or the Adjust ♦ knob to select On or Off. Select other inputs as necessary to configure.

Reset submenu

The Reset submenu resets all ISM 482 settings and adjustments to the default values and erases all presets. The front panel reset performs the same functions as the ⎆Esc⎇ z *XXX* ↵ SIS command on page 43.

Reset the switcher by pressing and **holding** the Black/Mute button while this submenu is active. The LCD displays **Unit Reset to Factory Defaults** when the reset is complete. Release the Black/Mute button.

User Presets menu

Figure 21 is a flowchart that shows an overview of the User Presets menu, the Save Preset and Erase Preset submenus, and the available settings.
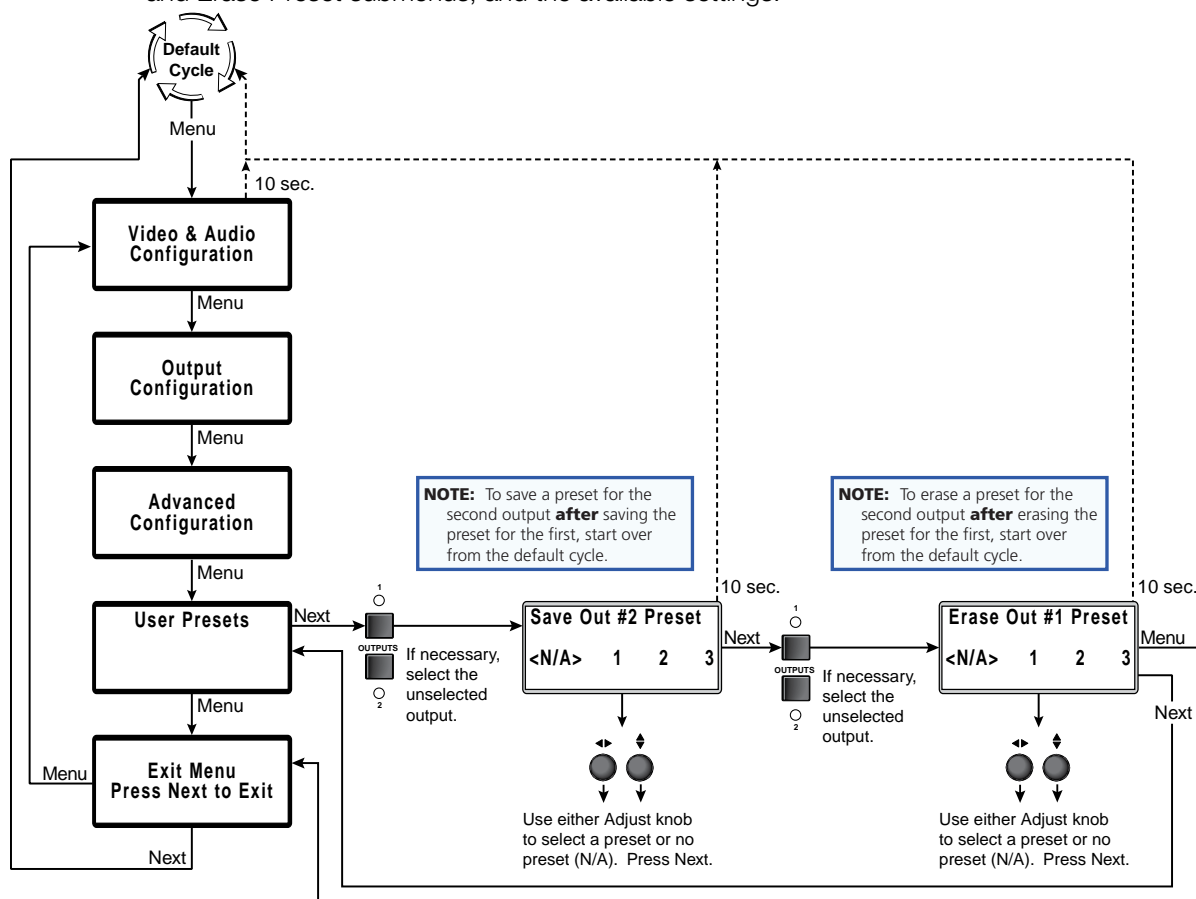
Figure 21. User Presets Menu Flowchart

Save Preset submenu

Select the output with the settings that you want to save as a preset by pressing the desired Output button.

Rotate either the Adjust ↕ or the Adjust ◄► knob while in the Save Preset submenu to highlight (< >) one of three memory presets for the selected output or highlight N/A for no preset. Press the Next button to save the current settings to the selected preset. Select N/A and press the Next button to exit without saving the settings.

Presets are saved sets of values for the current color, tint, contrast, brightness, detail, sizing, and centering settings. Presets saved in nonvolatile memory; when the ISM is powered down and later powered back up, the settings are available for selection. Saving the settings to a preset number overwrites the settings previously written to that preset number.

NOTE: The color, tint, contrast, brightness, detail, sizing, and centering adjustments are tailored for the selected output rate. If you change the output rate and then recall a preset for the earlier rate, the adjustments recalled in the preset have no effect on the video output. However, if you then change back to the earlier output rate, the effects of the adjustments appear on the screen if they were not overwritten for the old output rate.

User presets are recalled using the Input buttons. See **Recalling a user preset**, on page 13, for instructions on recalling a user preset.

Erase Preset submenu

Select the output with the settings that you want to erase by pressing the desired Output button.

Rotate either the Adjust ↕ or the Adjust ◂▸ knob while the Erase Presets submenu is active to highlight (< >) one of three memory presets to erase or highlight N/A for no preset. Press the Next button to erase the preset. Highlight N/A and press the Next button to exit without erasing the settings.

Exit menu

From the Exit menu (see figure 22), press the Next button to return to the default display cycle, or press the Menu button to return to the Video & Audio Configuration menu.

```
           ┌──────────────────┐
           │   User Presets   │
           │                  │
           └──────────────────┘
                    │ Menu
                    ▼
           ┌──────────────────┐        ┌──────────┐
           │   Exit Menu      │  Next  │ Default  │
           │ Press Next to Exit├──────▶│  Cycle   │
           └──────────────────┘        └──────────┘
                    │ Menu
                    ▼
           ┌──────────────────┐
           │  Video & Audio   │
           │  Configuration   │
           └──────────────────┘
```
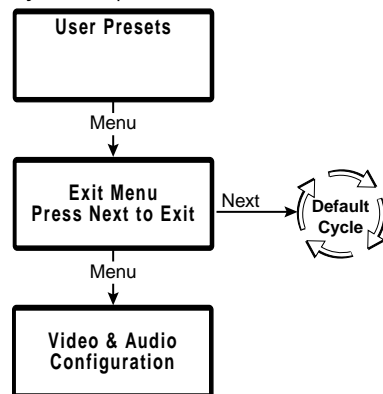
Figure 22.   Exit Menu Flowchart

Picture Adjustments

The picture adjustments allow you to fine tune the image quality of the selected input. When you press one of the Picture Adjustments buttons (Color/Tint, Brightness/Contrast, Size, Center, or Filter) once, the corresponding image adjustment menu for the selected output (lit Output LED) image appears on the LCD screen. Select the other output using the Output buttons to call the image adjustment menu for the other output. In either screen, adjustments can then be made by rotating the Adjust ◂▸ knob or the Adjust ↕ knob. Picture adjustment settings are stored in nonvolatile memory; when the switcher is powered down and powered up, the settings are restored.

Adjust an image for centering, sizing, brightness, contrast, color, tint, zoom, or detail as follows (see figure 23):
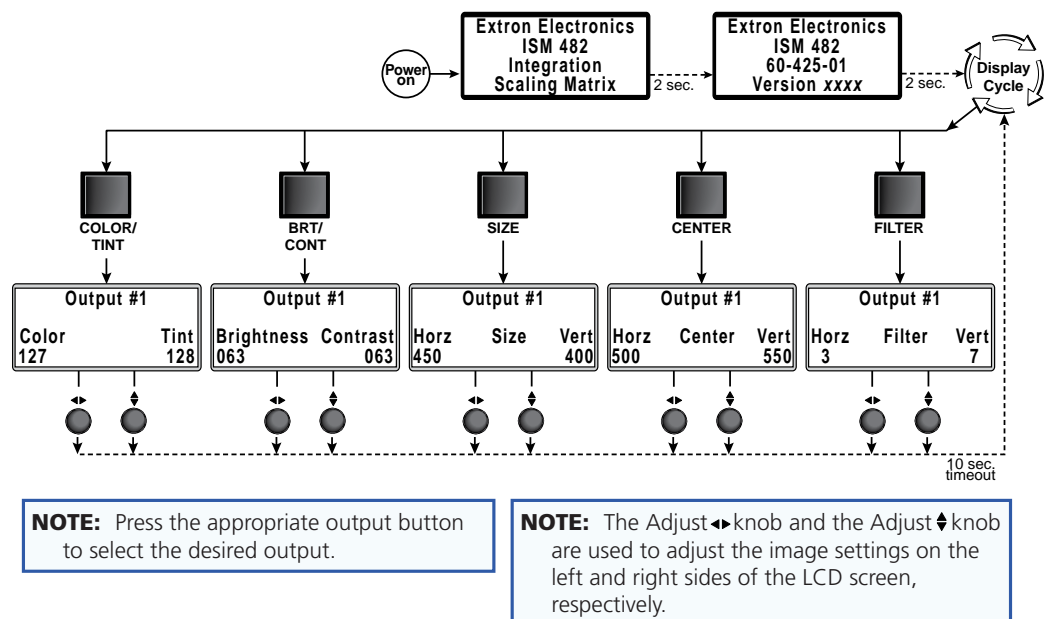
Figure 23. Picture Adjustments Flowchart

1. Press the desired input button and output button to select an input-output tie to adjust.

> **NOTES:**
> - The adjustments are made to the input signal as it is switched to the tied output (1 or 2) only. (The output LED is lit and the selected output is shown in the LCD). The adjustments do not affect the same input tied to the other output.
> - **Color** adjustments are available only for component video, S-video, and composite video inputs.
>
>   **Tint** adjustments are available only for S-video and composite video inputs.

2. Press the appropriate picture adjustment button: color and tint, brightness and contrast (Brt/Cont), sizing (Size), centering (Center), or filter. The LCD display shows the name of the adjustment and the current setting value.

3. Rotate the Adjust ◂▸ knob or Adjust ↕ knob to vary the settings within the following adjustment ranges:

> **NOTE:** The Adjust knobs have no mechanical limits to their rotation.

- **Color/Tint**: Color adjusts within a range of 0 to 127. Tint adjusts within a range of 0 to 255.
- **Brightness/Contrast**: The range for both adjustments is 0 to 63.
- **Size**: Observe the display and turn the Adjust ◂▸ knob to increase or decrease the horizontal size of the image. Turn the Adjust ↕ knob to increase or decrease the vertical size of the image. The adjustment range depends on the input rate applied and the selected output resolution.
- **Center**: Observe the display and turn the Adjust ◂▸ knob to center the image horizontally or the Adjust ↕ knob to center the image vertically. The adjustment range depends on the input rate applied and the selected output resolution.
- **Horizontal and vertical filter (RGB or component video input)**:
  Horizontal (Horz) adjusts within a range of 0 to 3.
  Vertical (Vert) adjusts within a range of 0 to 7.
- **Filter (S-video and composite video input)**:
  Either knob adjusts within a range of 0 to 7.

4. Repeat steps 2 and 3 for each image adjustment to be made for that output.

5. If you want to set picture adjustment on the another tie, press the another input button or the other output button.

Front Panel Security Lockout (Executive Mode)

The front panel security lockout limits the operation of the Integration Scaling Matrix switcher from the front panel. When the switcher's front panel is locked, all of the front panel functions are disabled except for input and output selection and black/mute selection.

To toggle the front panel lock on and off, press and **hold** the Color/Tint and Center buttons for approximately 2 seconds (see figure 24). The LCD displays **Executive Mode Enabled** or **Executive Mode Disabled** to indicate the mode. Release the buttons. The LCD also displays **Executive Mode Enabled** if you push a locked out button when the switcher's front panel is locked.
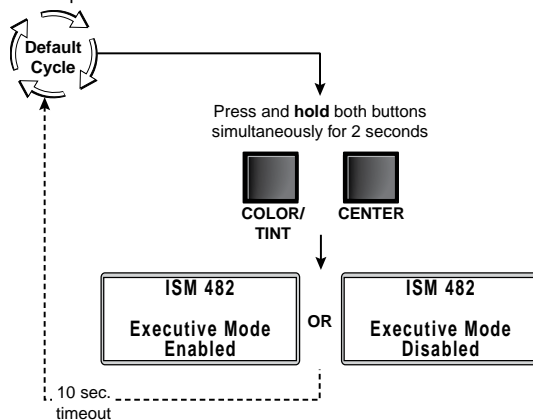
Figure 24. Front Panel Security Lockout Flowchart

IP Information

To set up the ISM for operation via its Ethernet port, you need to know and be able to change the IP address. One way to do this is via the IP address and hardware address screen.

To access the IP address and hardware address screen, press and hold the Color/Tint and Detail buttons while you apply power to the ISM (see figure 25). When the ISM is finished initializing, it displays both addresses.
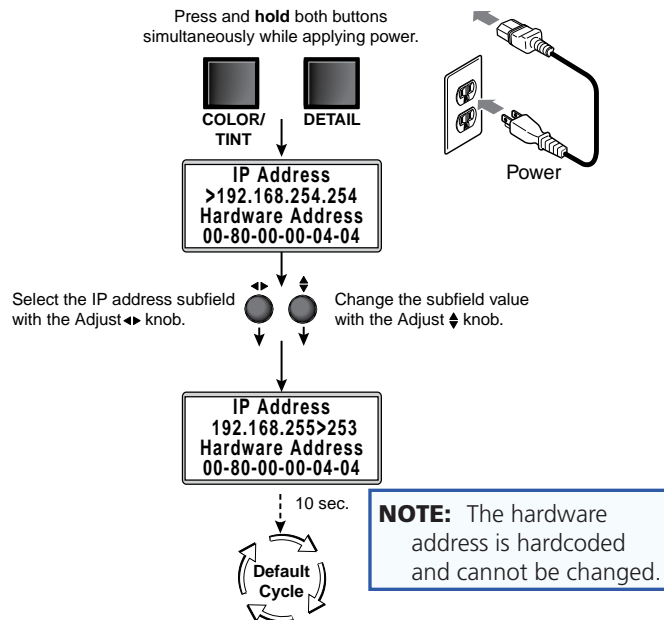
Figure 25. IP Information Flowchart

If you need to change the IP address, use the Adjust ◄► knob to select the desired subfield. Rotate the Adjust ↕ knob to change the value. Repeat the adjustment for other subfields as required.

Valid IP addresses consist of four 1-, 2-, or 3-digit numeric subfields separated by dots (periods). Each field can be numbered from 000 through 255. Leading zeroes, up to 3 digits total per field, are optional. Values of 256 and above are invalid.

NOTES:
- If the local system administrators have not changed the value, the factory-specified default, 192.168.254.254, is the correct value for this field.
- The hardware address is hardcoded and cannot be changed.

Optimizing the Video

Perform the following steps, in sequence, after you have installed the ISM. This procedure will help you to configure the switcher for the best settings for your display environment. In a multi-screen environment, perform this procedure for each display.

See **Advanced Configuration menu** on page 20, to select and output a test pattern and to select and output blue-only video.

See **Picture Adjustments** on page 25, to make adjustments to the picture quality.

See **User Presets menu** on page 23, to save presets.

1. **If you are using a digital display** such as an LCD or DLP projector, use the alternating pixels test pattern as a reference to adjust the phase and dot clock on the display devices. Proceed to step 3.

    If you are using a CRT display, use the cross hatch test pattern as a reference to converge the display.

2. Set the ISM to output either the crop test pattern for 4:3 video or the appropriate aspect ratio test pattern.

3. Use the display's positioning controls to position the image so that you can see all sides of the test pattern on the display.

    > **NOTE:** For the best results of this optimizing procedure, do not use the ISM's centering controls to position the image.

4. Select an input. Use the ISM's size and center functions to fill the crop or aspect ratio test pattern.

    > **NOTES:**
    >
    > - If the input source is a DVD, set the DVD player to output a 16:9 aspect ratio (see "Setting up a DVD source" on the next page) before sizing the image using the ISM's size function to correct the aspect ratio.
    > - When you are sizing and centering a letterbox movie video source, increasing the brightness on the ISM makes it easier to see the top and bottom of the active video.

5. If the input source is RGB, use the horizontal and vertical detail adjustments to increase the sharpness.

6. For S-video and composite video inputs, set the ISM to output blue-only video and to output the Color Bars test pattern. Using the blue Color Bars as a reference, use the ISM's color and tint controls to adjust the video's color and tint.

7. For RGB video inputs, set brightness and contrast levels (see **Picture Adjustments** on page 25.

8. Save this setting into one of the user memories using the User Presets menu (see **User Presets menu** on page 23).

Setting up a DVD source

To get the best results when using a DVD as a video source, Extron recommends that the DVD player itself be set up to output an aspect ratio of 16:9 and not 4:3. Because all DVDs are mastered as 16:9, having them set up for anything else causes the player to internally scale and compress the signal. The DVD player's scaling and compression defeats the advantage of having 3-2 pulldown detection in the ISM.

All sizing adjustments to correct the aspect ratio should be done using the ISM.

To change the output aspect ratio of most DVD players:

1. Enter the DVD player's setup or action menu while the disc is stopped.
2. Select the 16:9 aspect ratio.

Optimizing the Audio

Each individual input audio level can be adjusted within a range of -24 dB to +9 dB, so there are no noticeable volume differences between sources and for the best headroom and signal-to-noise ratio. Adjust the audio gain and attenuation as follows:

1. Connect audio sources to all desired inputs and connect the audio outputs to output devices such as audio players (see **Input connections** on page 6 and **Standard output connections** on page 8). For best results, wire all of the inputs and the outputs unbalanced.
2. Power on the audio sources, the switcher, and the audio players.
3. Switch among the inputs (see **Selecting an input** on page 13), listening to the audio with a critical ear or measuring the output audio level with test equipment, such as a VU meter.
4. As necessary, adjust the audio level of each input (see **Video & Audio Configuration menu** on page 17) so that the output level is approximately the same for all selected inputs.

Troubleshooting

The following tips may help you in troubleshooting.

- Some symptoms may resemble others, so you may want to look through all of the examples before attempting to solve the problem.
- Be prepared to backtrack in case the action taken does not solve the problem.
- It may help to keep notes and sketches in case the troubleshooting process gets lengthy. This will also give you something to discuss if you call for technical support.
- Try simplifying the system by eliminating components that may have introduced the problem or made it more complicated.
- **For sync-related problems**: Portable digital projectors are designed to operate close to the video source. Sync problems may result from using long cables or from improper termination. A sync adapter, such as the Extron ASTA (active sync termination adapter), may help solve these problems.
- **For LCD and DLP projectors and plasma displays**: In addition to the sync-related information above, check the user's manual that came with the projector for troubleshooting tips, as well as for settings and adjustments. Each manufacturer may have its own terms, so look for terms like "auto setup," "auto sync," "pixel phase," and "tracking."

General Checks

1. Ensure that all devices are plugged in and powered on. The switcher is receiving power if the LCD is displaying the default display cycle.

2. Ensure an active input is selected on the switcher.

3. Ensure that the proper signal format is supplied.

4. Check the cabling and make corrections as necessary.

5. Call the Extron S3 Sales & Technical Support Hotline if necessary.

Specific Problems

The table below shows some common operating problems and their solutions.

Problem	Cause	Solution
No image appears.	The input signal is incompatible with the ISM.	Connect an input device that is compatible with the ISM.
	The input is improperly configured.	Use the Video & Audio Configuration submenu to select the correct input format.
	Freeze mode was entered via an SIS command when the image was black.	Deactivate freeze mode via an SIS command.
	The scaled output rate is too high for the display.	Change the scaled output to a compatible resolution
The image is flashing	The scaled output rate is too high for the display.	Change the scaled output to a compatible resolution.
The image is too soft.	The detail level needs to be changed.	Use the Filter button to change the detail level.
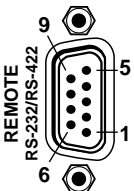
Programming Guide

This section describes:

- **RS-232 Link**
- **Ethernet Link**
- **Symbols**
- **Switcher-Initiated Messages**
- **Host-to-Switcher Instructions**
- **Switcher Error Responses**
- **Using the Command and Response Table**

RS-232 Link

The switcher's rear panel Remote port 9-pin D female connector (see figure 26) can be connected to the RS-232 serial port output of a host device, such as a computer running the HyperTerminal utility or a control system. This connection makes software control of the switcher possible.

Pin	RS-232	Function	RS-422	Function
1	—	Not used	—	Not used
2	TX	Transmit data	TX–	Transmit data (–)
3	RX	Receive data	RX–	Receive data (–)
4	—	Not used	—	Not used
5	Gnd	Signal ground	Gnd	Signal ground
6	—	Not used	—	Not used
7	—	Not used	RX+	Receive data (+)
8	—	Not used	TX+	Transmit data (+)
9	—	Not used	—	Not used

Figure 26. **Remote Connector Pin Arrangement**

The protocol is 9600 baud, 8-bit, 1 stop bit, no parity, and no flow control.

Ethernet Link

The rear panel Ethernet connector on the switcher can be connected to the an Ethernet LAN or WAN (see figure 27). This connection makes SIS control of the switcher possible using a computer connected to the same LAN or WAN.

Pins:
12345678

Insert Twisted
Pair Wires

**RJ-45
Connector**

Crossover Cable

Pin	End 1 Wire color	End 2 Wire color
1	White-green	White-orange
2	Green	Orange
3	White-orange	White-green
4	Blue	Blue
5	White-blue	White-blue
6	Orange	Green
7	White-brown	White-brown
8	Brown	Brown
	T568A	**T568B**

A cable that is wired as T568A at one end and T568B at the other (Tx and Rx pairs reversed) is a "crossover" cable.

Straight-through Cable

Pin	End 1 Wire color	End 2 Wire color
1	White-orange	White-orange
2	Orange	Orange
3	White-green	White-green
4	Blue	Blue
5	White-blue	White-blue
6	Green	Green
7	White-brown	White-brown
8	Brown	Brown
	T568B	**T568B**

A cable that is wired the same at both ends is called a "straight-through" cable, because no pin/pair assignments are swapped.

Figure 27. RJ-45 Connector Pinout Tables

Ethernet Connection

The cable can be terminated as either a patch cable or a crossover cable (see figure 27) and must be properly terminated for your application:

- **Patch (straight) cable** — Connection of the ISM to an Ethernet hub, router, or switcher that also hosts a controlling computer

- **Crossover cable** — Direct connection between the ISM and a computer

Default Address

To access the switcher via the Ethernet port, you need the switcher's IP address. If the address has been changed to an address comprised of words and characters, the actual numeric IP address can be determined using the front panel (see **IP Information** on page 27) or the Ping utility (see **Pinging to Determine the Switcher IP Address** or **Ping to determine the Web IP address** on page 70 for more details). If the address has not been changed, the factory-specified default is 192.168.254.254.

Symbols

Symbols (X# values), defined below, are used throughout the discussions of the switcher-initiated messages that begins on the next page and the command/response table that begins on page 37. The symbols represent variables in the switcher-initiated messages and the command/response table fields.

↵ = Carriage return/line feed

← = Carriage return (no line feed)

| = Pipe (can be used interchangeably with the ← character)

• = space

Esc = Escape key

W = Can be used interchangeably with the Esc character

X1 = Input number (1 through 8)

X2 = Output number (1 or 2)

X3 = Ø = off, 1 = on

X4 = Input video type:

Ø	= RGB	5	= Betacam 60
1	= RGBcvS	6	= HDTV
2	= YUVi	7	= S-video
3	= YUVp	8	= Composite
4	= Betacam 50		

X5 = Switcher resolution:

ØØ	= 640x480	Ø9	= 1365x1024
Ø1	= 800x600	1Ø	= 720p*
Ø2	= 832x624	11	= 1080p
Ø3	= 848x480	12	= 1080i
Ø4	= 852x480	13	= 1400 x 1050
Ø5	= 1024x768*	14	= 576p
Ø6	= 1280x768*	15	= 1366x768
Ø7	= 1280x1024*	16	= 1365x768
Ø8	= 1360x765	17	= 1280x800

> **NOTE:** * Native DVI resolution.

X6 = Video refresh rate:

Ø	= 50 Hz	3	= 75 Hz
1	= 56 Hz	4	= 85 Hz
2	= 60 Hz	5	= AFL*

> **NOTE:** Lock or AFL is Accu-RATE Frame Lock™
> (PAL = 50 Hz, NTSC = 59.94 Hz).

X7 = Output video type: Ø = RGBHV, 1 = RGBS

X8 = Output sync polarity:

Ø	= Horizontal – / Vertical –	2	= Horizontal +/ Vertical –
1	= Horizontal –/ Vertical +	3	= Horizontal +/ Vertical +

X9 = Color value (Ø thru 127)

X10 = Tint value (Ø thru 255)

X11 = Brightness and contrast value (Ø thru 63)

X12 = Size value (range depends on the resolution)

X13 = Centering value (range depends on the resolution)

X14 = Blanking value (ØØØ thru 2ØØ)

X15 = Pixel sampling phase (ØØØ thru Ø31)

X16 = Horizontal filter value (Ø thru 3)

X17 = Vertical filter or composite/S-video detail filter (1 thru 7)

X18 = Preset number (Ø1 thru Ø3)

X19 = Output 1 / Output 2 selection

Output 1 / Output 2	**Output 1 / Output 2**
Ø = Off/Off	2 = Off/On
1 = On/Off	3 = On/On

X20 = RGB delay in 0.01 second steps (ØØ [no delay] to 5Ø [5.0 seconds])

X21 = Test pattern type (ØØ1 through Ø1Ø)

ØØ1 =	color bars	ØØ6 =	alternating pixels
ØØ2 =	crosshatch	ØØ7 =	film aspect ratio 1.78
ØØ3 =	4x4 crosshatch	ØØ8 =	film aspect ratio 1.85
ØØ4 =	gray scale	ØØ9 =	film aspect ration 2.35
ØØ5 =	crop	Ø1Ø =	ramp

X22 = Gain/attenuation: –24dB to +•9 dB, each step = 1 dB

X23 = Gain value: Numeric dB value, Ø to +9

X24 = Attenuation value: Numeric dB value, –1 to –24

X25 = Frequency: *nnn.nn* (kHz [horizontal] or Hz [vertical])

X26 = Detected input signal standard (Ø through 4)

Ø = none	3 = NTSC 4.43
1 = NTSC 3.58	4 = SECAM
2 = PAL	

> **NOTE:** Dash (–) = not applicable (occurs when the input is set for RGB or progressive YUV).

X29 = "Take" effect: ØØ = cut, Ø1 = dissolve

Switcher-Initiated Messages

When a local event such as power-up or a front panel operation occurs, the switcher responds by sending a message to the host. The switcher-initiated messages are listed in the following pages. The messages are underlined.

The switcher does not expect a response from the host; but, for example, the host program might request a new status.

Power-up

(c) Copyright 20*nn*, Extron Electronics, ISM 482 V*x.xx*↵

The switcher initiates the copyright message when it is first powered on. `Vx.xx` is the firmware version number.

Ties Creation

Out‾x2‾•In‾x1‾•All↵

A front panel video and audio switching operation has occurred. ‾x2‾ is the output number and ‾x1‾ is the input number.

Out‾x2‾•In‾x1‾•RGB↵

A front panel video-only switching operation has occurred. ‾x2‾ is the output number and ‾x1‾ is the input number.

Out‾x2‾•In‾x1‾•Aud↵

A front panel audio-only switching operation has occurred. ‾x2‾ is the output number and ‾x1‾ is the input number.

Input and Output Video Type

‾x1‾Typ‾x4‾↵

A front panel input video type selection has occurred. ‾x2‾ is the input number and ‾x4‾ is the input video type.

‾x2‾Rte‾x5‾‾x6‾↵

A front panel output video format selection has occurred. ‾x2‾ is the output number, ‾x5‾ is the output resolution, and ‾x6‾ is the output refresh rate.

‾x2‾Syn‾x7‾↵

A front panel output video type selection has occurred. ‾x2‾ is the output number and ‾x7‾ is the output video format (RGBHV or RGBS).

‾x2‾Pol‾x8‾↵

A front panel output video polarity selection has occurred. ‾x2‾ is the output number and ‾x8‾ is the output sync polarity.

Picture Adjustments

‾x2‾Col‾x9‾↵

A front panel color adjustment has occurred. ‾x2‾ is the output number tied to the adjusted input and ‾x9‾ is the color variable.

‾x2‾Tin‾x10‾↵

A front panel tint adjustment has occurred. ‾x2‾ is the output number tied to the adjusted input and ‾x10‾ is the tint variable.

`X2Brt X11 ↵`

A front panel color brightness adjustment has occurred. `X2` is the output number tied to the adjusted input and `X11` is the brightness variable.

`X2Con X11 ↵`

A front panel contrast adjustment has occurred. `X2` is the output number tied to the adjusted input and `X11` is the contrast variable.

`X2Hsz X12 ↵`

A front panel horizontal size adjustment has occurred. `X2` is the output number and `X12` is the size variable.

`X2Vsz X12 ↵`

A front panel vertical size adjustment has occurred. `X2` is the output number and `X12` is the size variable.

`X2Hph X13 ↵`

A front panel horizontal centering adjustment has occurred. `X2` is the output number and `X13` is the centering variable.

`X2Vph X13 ↵`

A front panel vertical centering adjustment has occurred. `X2` is the output number and `X13` is the centering variable.

`X2Blt X14 ↵`

A front panel top line blanking adjustment has occurred. `X2` is the output number and `X14` is the blanking variable.

`X2Blb X14 ↵`

A front panel bottom line blanking adjustment has occurred. `X2` is the output number and `X14` is the blanking variable.

`X2Phs X15 ↵`

A front panel pixel phase adjustment has occurred. `X2` is the output number and `X15` is the pixel phase variable.

`X2Dhz X16 ↵`

A front panel horizontal detail filter adjustment has occurred for the **RGB or component video** input tied to output `X2`. `X16` is the filter variable.

`X2Dvz X17 ↵`

A front panel vertical detail filter adjustment has occurred for the **RGB or component video** input tied to output `X2`. `X17` is the filter variable.

`X2Dvz X17 ↵`

A front panel horizontal detail filter adjustment has occurred for the **S-video or composite video** input tied to output `X2`. `X17` is the filter variable.

`1Blu X19 ↵`

The blue-only mode has been turned on or off from the front panel for one or both outputs. `X19` is the on/off status for the either or both outputs. The leading "1" is meaningless.

`1Fil X19 ↵`

The edge enhancement mode has been turned on or off from the front panel for one or both outputs. `X19` is the on/off status for the either or both outputs. The leading "1" is meaningless.

RGB Delay

`x2Dlyx20↵`

A front panel RGB delay adjustment has occurred. `x2` is output number and `x20` is the delay value, in 0.01 second steps. `x20` can be as much as 50 = 5.0 seconds.

Test Pattern

`Tstx19*x21↵`

A test pattern has been turned on or off from the front panel for one or both outputs. `x19` is the on/off status for the two outputs and `x21` is the test pattern selected.

Audio Gain and Attenuation

`x1Audx22↵`

A front panel audio input level adjustment has occurred. `x1` is input number and `x22` is the audio gain or attenuation level.

Video and Audio Mute

`x2Vmtx3↵`

A front panel video mute operation has occurred. `x2` is output number and `x3` is the mute status: 0 = off (video not muted), 1 = on (video muted).

`x2Amtx3↵`

A front panel audio mute operation has occurred. `x2` is output number and `x3` is the mute status: 0 = off (audio not muted), 1 = on (audio muted).

PAL Film Mode

`x1Flmx3↵`

The PAL film mode has been selected or deselected from the front panel for the selected input. `x1` is input number and `x3` is the on/off status for PAL film mode.

Automated Adjustments

`Imgx3↵`

The Auto Image feature has been turned on or off from the front panel for all tie creations. `x3` is the on/off status.

`Autx3↵`

The Auto Presets feature has been turned on or off from the front panel for all tie creations. `x3` is the on/off status.

`1Enhx19↵`

The enhanced mode feature has been turned on or off from the front panel for S-video or composite video that is tied to one or both outputs. `x19` is the on/off status for the two outputs. The leading "1" is meaningless.

`x2Reconfig↵`

The input selected for the `x2` output has been adjusted using the Auto Image feature or a user preset.

Host-to-Switcher Instructions

The switcher accepts SIS commands through its RS-232 port and/or its Ethernet port. SIS commands consist of one or more characters per command field. They do not require any special characters to begin or end the command character sequence. Each switcher response to an SIS command ends with a carriage return and a line feed (CR/LF = ↵), which signals the end of the response character string. A string is one or more characters.

Switcher Error Responses

When the switcher receives an SIS command and determines that it is valid, it performs the command and sends a response to the host device. If the switcher is unable to perform the command because the command is invalid or contains invalid parameters, the switcher returns an error response to the host. The error response codes are:

E01 — Invalid input channel number (too large)

E10 — Invalid command

E11 — Invalid preset number (zero or too large)

E12 — Invalid output number (zero or too large)

E13 — Invalid value (out of range)

Using the Command and Response Table

The command/response table begins on the next page. Except for the gain and attenuation settings and the filter settings, upper or lower case letters are acceptable in the command field. The table below shows the hexadecimal equivalent of each ASCII command.

> **NOTE:**   With the exception of the audio gain and attenuation (**G** and **g**) and horizontal and vertical filtering (**D** and **d**) commands, the SIS commands are **not** case sensitive.

Space →

ASCII to Hex Conversion Table																Esc	1B	CR	0D	LF	0A
	20	!	21	"	22	#	23	$	24	%	25	&	26	'	27
(	28	)	29	*	2A	+	2B	,	2C	-	2D	.	2E	/	2F
0	30	1	31	2	32	3	33	4	34	5	35	6	36	7	37
8	38	9	39	:	3A	;	3B	<	3C	=	3D	>	3E	?	3F
@	40	A	41	B	42	C	43	D	44	E	45	F	46	G	47
H	48	I	49	J	4A	K	4B	L	4C	M	4D	N	4E	O	4F
P	50	Q	51	R	52	S	53	T	54	U	55	V	56	W	57
X	58	Y	59	Z	5A	[	5B	\	5C	]	5D	^	5E	_	5F
`	60	a	61	b	62	c	63	d	64	e	65	f	66	g	67
h	68	i	69	j	6A	k	6B	l	6C	m	6D	n	6E	o	6F
p	70	q	71	r	72	s	73	t	74	u	75	v	76	w	77
x	78	y	79	z	7A	{	7B	l	7C	}	7D	~	7E	DEL	7F

Command and Response Table for SIS Commands

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
Creating ties			
Create video and audio tie	X2*X1!	OutX2•InX1•All↵	Select input X1 to output X2.
Example:	1*2!	Out1•In2•All↵	Tie input 2 video and audio to output 2.
Create video only tie	X2*X1&	OutX2•InX1•RGB↵	Tie video input X1 to output X2.
Example:	2*5&	Out2•In5•RGB↵	Tie input 5 video only to output 2.
Create audio only	X2*X1$	OutX2•InX1•Aud↵	Tie audio input X1 to output X2.
Reading ties			
View video and audio tie	X2!	X1↵	Video and audio input X1 are tied to output X2.
View video tie	X2&	X1↵	Video input X1 is tied to output X2.
View audio tie	X2$	X1↵	Audio input X1 is tied to output X2.
Video mute			
Video mute on	X2*1B	X2VmtX3↵	Set the video output X2 to black.
Video mute off	X2*ØB	X2VmtX3↵	Set the video output X2 to the selected video input (1 through 8).
View video mute status	X2B	X3↵	Video mute is X3 for output X2.
Input video type			
Set video type	X1*X4\	X1TypX4↵	Specify input X1 video type.
Example:	4*3\	4TypØØ3↵	Specify input 4 type as YUVp.
View video type	X1\	X4↵	Input X1 video type is X4.
Scaler output video type			
Set output resolution and rate	X2*X5*X6=	X2RteX5*X6↵	Command character is "equals".
Example:	1*5*4=	1*RteØØ5*ØØ4↵	Set output 1 to 1024x768 at 85 Hz.
View resolution and rate	X2=	X2RteX5*X6↵	
Color			

> **NOTES:**
> - Color adjustments are available only for interlaced component video (YUVi), S-video, and composite video inputs.
> - The X2 value specified is the output to which the adjusted input is switched.

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
Set a specific color value	X2*X9C	X2ColX9↵	Specify the color adjustment.
Increment color value	X2+C	X2ColX9↵	Increase the color setting by one.
Decrement color value	X2–C	X2ColX9↵	Decrease the color setting by one.
View the color value	X2C	X9↵	Show the color setting.

NOTE:

X1 = Input number	1 through **8**								
X2 = Output number	1 or **2**								
X3 = Mute status	Ø = off, 1 = on								
X4 = Video type	Ø	=	RGB	3	=	YUVp	5	=	Betacam 60	7	=	S-video
	1	=	RGBcvS	4	=	Betacam 50	6	=	HDTV	8	=	Composite
	2	=	YUVi									
X5 = Switcher resolution	ØØ	=	640x480	Ø5	=	1024x768	1Ø	=	720p	14	=	576p
	Ø1	=	800x600	Ø6	=	1280x768	11	=	1080p	15	=	1366x768
	Ø2	=	832x624	Ø7	=	1280x1024	12	=	1080i	16	=	1365x768
	Ø3	=	848x480	Ø8	=	1360x765	13	=	1400 x 1050	17	=	1280x800
	Ø4	=	852x480	Ø9	=	1365x1024						
X6 = Video refresh rate	Ø	=	50 Hz	2	=	60 Hz	4	=	85 Hz	5	=	AFL
	1	=	56 Hz	3	=	75 Hz						
X9 = Color value	Ø thru **127**								

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
Tint			

NOTES:

- Tint adjustments are available only for S-video and composite video inputs.
- The [X2] value specified is the output to which the adjusted input is switched.

Command Function	SIS Command	Response	Additional description
Set a specific tint value	[X2]*[X10]T	[X2]Tin[X10]↵	Specify the tint adjustment.
Increment tint value	[X2]+T	[X2]Tin[X10]↵	Increase the tint setting by one.
Decrement tint value	[X2]−T	[X2]Tin[X10]↵	Decrease the tint setting by one.
View the tint value	[X2]T	[X10]↵	Show the tint setting.
Brightness			

NOTE: The [X2] value specified is the output to which the adjusted input is switched.

Command Function	SIS Command	Response	Additional description
Set a specific brightness value	[X2]*[X11]Y	[X2]Brt[X11]↵	Specify the brightness adjustment.
Increment brightness value	[X2]+Y	[X2]Brt[X11]↵	Increase the brightness.
Decrement brightness value	[X2]−Y	[X2]Brt[X11]↵	Decrease the brightness.
View the brightness value	[X2]Y	[X11]↵	Show the brightness setting.
Contrast			

NOTE: The [X2] value specified is the output to which the adjusted input is switched.

Command Function	SIS Command	Response	Additional description
Set a specific contrast value	[X2]*[X11]^	[X2]Con[X11]↵	Specify the contrast adjustment.
Increment contrast value	[X2]+^	[X2]Con[X11]↵	Increase the contrast.
Decrement contrast value	[X2]−^	[X2]Con[X11]↵	Decrease the contrast.
View the contrast value	[X2]^	[X11]↵	Show the contrast setting.
Horizontal size			
Set a specific horizontal size	[X2]*[X12]:	[X2]Hsz[X12]↵	Specify the horizontal size.
Increase the horizontal size	[X2]+:	[X2]Hsz[X12]↵	Widen the picture.
Decrease the horizontal size	[X2]−:	[X2]Hsz[X12]↵	Make the picture narrower.
View the horizontal size	[X2]:	[X12]↵	Show the horizontal size.
Vertical size			
Set a specific vertical size	[X2]*[X13];	[X2]Vsz[X12]↵	Specify the vertical size.
Increase the vertical size	[X2]+;	[X2]Vsz[X12]↵	Make the picture taller.
Decrease the vertical size	[X2]−;	[X2]Vsz[X12]↵	Make the picture shorter.
View the vertical size	[X2];	[X12]↵	Show the vertical size.
Horizontal shift			
Set a specific horizontal position	[X2]*[X13]H	[X2]Hph[X13]↵	Specify the horizontal position.
Increment right	[X2]+H	[X2]Hph[X13]↵	Shift the picture right.
Decrement left	[X2]−H	[X2]Hph[X13]↵	Shift the picture left.
View the horizontal position	[X2]H	[X13]↵	Show the horizontal position.
Vertical shift			
Set a specific vertical position	[X2]*[X13]/	[X2]Vph[X13]↵	Specify the vertical position.
Increment up	[X2]+/	[X2]Vph[X13]↵	Shift the picture up.
Increment down	[X2]−/	[X2]Vph[X13]↵	Shift the picture down.
View the vertical position	[X2]/	[X13]↵	Show the vertical position.

NOTE:
[X2] = Output number — 1 or 2
[X10] = Tint value — Ø thru 255
[X11] = Brightness and contrast value — Ø thru 63
[X12] = Size value — range depends on the resolution
[X13] = Centering value — range depends on the resolution
[X14] = Blanking value — ØØØ thru 2ØØ

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
Top blanking			
Set a top blanking value	[X2]*[X14](	[X2]Blt[X14]↵	
Example	1*2(	1Blt2↵	Blank the top two lines of output 1.
Increment top blanking value	[X2]+ (	[X2]Blt[X14]↵	Increase blanking value 1 line.
Decrement top blanking value	[X2]– (	[X2]Blt[X14]↵	Decrease blanking value 1 line.
View the top blanking value	[X2](	[X2]Blt[X14]↵	
Bottom blanking			
Set a bottom blanking value	[X2]*[X14])	[X2]Blb[X14]↵	
Example:	2*5)	2Blb5↵	Blank the bottom five lines of output 2.
Increment bottom blanking value	[X2]+)	[X2]Blb[X14]↵	Increase blanking value 1 line.
Decrement bottom blanking value	[X2]–)	[X2]Blb[X14]↵	Decrease blanking value 1 line.
View the bottom blanking value	[X2])	[X2]Blb[X14]↵	
Pixel phase			
Set a specific pixel sampling phase	[X2]*[X15]U	[X2]Phs[X15]↵	Specify the pixel sampling phase.
Increment sampling value	[X2]+U	[X2]Phs[X15]↵	Increase the phase value.
Decrement sampling value	[X2]–U	[X2]Phs[X15]↵	Decrease the phase value.
View the sampling value	[X2]U	[X15]↵	Show the pixel sampling phase.

Horizontal detail filter (RGB and component video inputs)

> **NOTES:**
> - The horizontal detail filter is available only for RGB and component video inputs. The same command with a different [X#] variable is available to set a combined detail filter for S-video and composite video inputs.
> - The [X2] value specified is the output to which the filtered input is switched.
> - The command (D) **is** case sensitive.

Command Function	SIS Command	Response	Additional description
Set a specific filter value	[X2]*[X16]D	[X2]Dhz[X16]↵	Set the horizontal detail level.
Increment filter value	[X2]+D	[X2]Dhz[X16]↵	Increase the horizontal detail level.
Decrement filter value	[X2]–D	[X2]Dhz[X16]↵	Decrease the horizontal detail level.
View the horizontal filter value	[X2]D	[X16]↵	Show the horizontal detail level.

Vertical detail filter (RGB and component video inputs)

> **NOTES:**
> - The vertical detail filter is available only for RGB and component video inputs.
> - The [X2] value specified is the output to which the filtered input is switched.
> - The command (d) **is** case sensitive.

Command Function	SIS Command	Response	Additional description
Set a specific filter value	[X2]*[X17]d	[X2]Dvz[X17]↵	Set the vertical detail level.
Increment filter value	[X2]+d	[X2]Dvz[X17]↵	Increase the vertical detail level.
Decrement filter value	[X2]–d	[X2]Dvz[X17]↵	Decrease the vertical detail level.
View the vertical filter value	[X2]d	[X17]↵	Show the vertical detail level.

NOTE:
[X2] = Output number	1 or 2
[X14] = Blanking value	ØØØ thru 2ØØ
[X15] = Pixel sampling phase	ØØØ thru Ø31
[X16] = Horizontal filter value	Ø thru 3
[X17] = Vertical filter	1 thru 7

Command and Response Table for SIS Commands (continued)

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
Detail filter (S-video and composite video inputs)			
NOTES:			
• Composite and S-video inputs support a single detail filter only, rather than separate horizontal and vertical filters. To apply a detail filter to the scaled output when the input is composite video or S-video, use the same command as the horizontal filter (D) with the $\boxed{X17}$ variable.			
• The $\boxed{X2}$ value specified is the output to which the filtered input is switched.			
Set a specific filter value	$\boxed{X2}$*$\boxed{X17}$D	$\boxed{X2}$Dhz$\boxed{X17}$↵	Set the detail filter level.
Increment filter value	$\boxed{X2}$+D	$\boxed{X2}$Dhz$\boxed{X17}$↵	Increase the detail filter level.
Decrement filter value	$\boxed{X2}$−D	$\boxed{X2}$Dhz$\boxed{X17}$↵	Decrease the detail filter level.
View the vertical filter value	$\boxed{X2}$D	$\boxed{X17}$↵	Show the detail filter level.
Auto Memories			
Auto memories on	1M	Aut1↵	Set the ISM to apply auto memories settings to all selected inputs.
Auto memories off	ØM	AutØ↵	Set the ISM to not apply auto memories settings.
View auto memories status	M	$\boxed{X3}$↵	Auto memories is $\boxed{X3}$ (on or off) for all inputs.
User presets			
NOTE: The $\boxed{X2}$ value specified is the output to which the input with the associated user preset is switched.			
Save user preset	$\boxed{X2}$*$\boxed{X18}$,	Spr$\boxed{X2}$•$\boxed{X18}$↵	Command code is comma. Save the $\boxed{X2}$ outputs settings as preset $\boxed{X18}$.
Recall user preset	$\boxed{X2}$*$\boxed{X18}$.	Rpr$\boxed{X2}$•$\boxed{X18}$↵	Command code is period. Recall preset $\boxed{X18}$ settings for $\boxed{X2}$ output.
Freeze			
Enable	$\boxed{X2}$*1F	$\boxed{X2}$Frz1↵	Output a "frozen" video image.
Disable	$\boxed{X2}$*ØF	$\boxed{X2}$FrzØ↵	Turn off freeze (output motion video).
View the freeze status	$\boxed{X2}$F	$\boxed{X3}$↵	Show the freeze status.
Example:	1F	Ø↵	Freeze mode is off for the program output.
Test pattern			
Select test pattern for an output	$\boxed{X19}$*$\boxed{X21}$J	Tst$\boxed{X19}$*$\boxed{X21}$↵	Select a test pattern for the $\boxed{X19}$ outputs.
View test pattern	J	$\boxed{X19}$*$\boxed{X21}$↵	Show the test pattern.
Example:	J	3*ØØ2↵	Crosshatch test pattern was selected for both outputs.

NOTE:

$\boxed{X2}$ = Output number	1 or 2	
$\boxed{X3}$ = Freeze status	Ø = off, 1 = on	
$\boxed{X17}$ = Composite and S-video detail filter	1 thru 7	
$\boxed{X18}$ = Preset number	Ø1 thru Ø3	
$\boxed{X19}$ = Program/preview output selection	Ø = Output 1 Off / Output 2 Off	2 = Output 1 Off / Output 2 On
	1 = Output 1 On / Output 2 Off	3 = Output 1 On / Output 2 On
$\boxed{X21}$ = Test pattern type	ØØ1 = color bars	ØØ6 = alternating pixels
	ØØ2 = crosshatch	ØØ7 = film aspect ratio 1.78
	ØØ3 = 4x4 crosshatch	ØØ8 = film aspect ratio 1.85
	ØØ4 = gray scale	ØØ9 = film aspect ration 2.35
	ØØ5 = crop	Ø1Ø = ramp

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
Set audio gain and attenuation			
NOTE: The set gain (G) and set attenuation command (g) *are* **case sensitive**. The increment, decrement and view commands are not case sensitive.			
Set gain	X1̲*X23̲G	X1̲AudX22̲↵	Set gain for input X1̲ to X23̲ dB.
Example:	4*3G	4Aud+•3↵	Set gain for input 4 to 3 dB.
Set attenuation	X1̲*X24̲g	X1̲AudX22̲↵	Set attenuation for input X1̲ to –X22̲ dB.
Increment level	X1̲+G	X1̲AudX22̲↵	Increase input X1̲ audio level by +1 dB.
Decrement level	X1̲–G	X1̲AudX22̲↵	Decrease input X1̲ audio level by –1 dB.
View audio level	X1̲g	X22̲↵	View gain for input X1̲.
Example:	4G	–•3↵	The ISM reports that the input 4 audio level is at –3 dB of attenuation.
Audio mute			
Audio mute on	X2̲*1Z	X2̲AmtX3̲↵	Mute the X2̲ audio output.
Audio mute off	X2̲*ØZ	X2̲AmtX3̲↵	Unmute the X2̲ audio output.
View audio mute status	X2̲Z	X3̲↵	Audio mute is X3̲ for X2̲ output.
Front panel security lockout (Executive mode)			
Disable	ØX	Exe0↵	Adjustments and selections can be made from the front panel.
Enable (lock image adjustments)	1X	Exe1↵	Lock front panel adjustments; adjust image via RS-232 only.
View the executive mode status	X	X3̲↵	Show executive mode status.
Example:	X	Ø↵	Executive mode is off.
Verbose mode			
NOTE: The default for verbose mode is **on** for the RS-232 connection and **off** for Ethernet connections.			
Disable (block reports)	Esc̲ØCV←	Vrb0↵	Turn off verbose mode. The ISM does not send the reports listed in **Switcher-initiated messages** earlier in this chapter.
NOTE: Disabling verbose mode blocks reports for front panel operations only, to this connection (RS-232 or Ethernet) only. The ISM continues to send responses to SIS commands to all ports. The ISM continues to send reports for front panel operations to other connections.			
Enable (allow reports)	Esc̲1CV←	Vrb1↵	Turn on verbose mode. The ISM sends all reports.
View the verbose mode status	Esc̲CV←	X3̲↵	Show verbose mode status.
Example:	Esc̲CV←	1↵	Verbose mode is on (the ISM ISMues reports).

NOTE:
- X1̲ = Input number — 1 through **8**
- X2̲ = Output number — 1 or **2**
- X3̲ = Freeze and front panel lock status — Ø = off, **1** = on
- X23̲ = Gain/attenuation — -**24dB** to +•**9dB**, each step = 1 dB
- X24̲ = Gain value — Numeric dB value, Ø to **+9**
- X25̲ = Attenuation value — Numeric dB value, –1 to –**24**

Command and Response Table for SIS Commands (continued)

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
Information requests			
Query firmware version number	Q	*x.xx*↵	Show the controller firmware version.
Request part number	N	60-423-01↵	Show the part number of the ISM.
Request general information	[X2]I	(See below)	Show the status of the ISM.
		Vid[X1]•Aud[X1]•Frz[X3]•Hrt[X25]•Vrt[X25]•Std[X26]↵	
			where: Hrt = horizontal rate (kHz) and
			Vrt = vertical rate (Hz)

> **NOTE:** *XXX:XX* means the signal is out of range.

> **NOTE:** The response to the View File Directory command differs, depending on whether the command is sent via an RS-232/RS-422 or Telnet connection or sent via a Web browser connection.

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
View file directory RS-232/RS-422 port and Telnet	[Esc]DF←	*filename*1,*date*/*time*,*length*↵ *filename*2,*date*/*time*,*length*↵ *filename*3,*date*/*time*,*length*↵ •⠀⠀⠀•↵ •⠀⠀⠀•↵ *filenamen*,*date*/*time*,*length*↵ # of Bytes•Left↵↵	
			List user-supplied files.
View file directory Web browser	[Esc]DF←	Var file = new array (); File [1] = '*filename*1,*date*1,*filesize*1'; File [2] = '*filename*2,*date*2,*filesize*2'; File [3] = '*filename*3,*date*3,*filesize*3'; •⠀⠀⠀• •⠀⠀⠀• File [*n*] = '*filenamen*,*daten*,*filesizen*'; File [*n*+1] = # of Bytes•Left	
			List user-supplied files.
Erase user-supplied Web pages/files	[Esc]<filename>EF←	Del<filename>↵	
Resets			
Zap all audio adjustments	[Esc]zA←	ZapA↵	Reset all audio levels to 0 dB.
Zap all ISM settings	[Esc]zXXX←	Zapx↵	**Reset all settings**: All inputs: RGB Ouput: RGBHV 1024x768 @ 60Hz RGB delay: 1.0 sec. Audio level: 0 dB Filtering: Horizontal = 3, Vertical = 7 Blanking: 0, top and bottom Pixel phase: 16 Dissolve speed (duration) 1.0 sec. Auto Image: Off Auto Memory recall: On
Absolute reset	[Esc]ZQQQ←	Zpq↵	Similar to **Zap all ISM settings**, plus clears IP address to 192.168.254.254 and deletes user and administrator passwords.

> **NOTE:** [X1] = Input number — 1 through 8
> [X3] = Verbose mode and freeze status — 0 = off, 1 = on
> [X25] = Frequency: *nnn.nn* (kHz [horizontal] or Hz [vertical])
> [X26] = Detected input signal standard (0 through 4)
>
> | 0 = none | 3 = NTSC 4.43 |
> |---|---|
> | 1 = NTSC 3.58 | 4 = SECAM |
> | 2 = PAL | _ = not applicable |

Command and Response Table for IP SIS Commands

Symbol definitions

Symbol	Definition	Format
X30	= ISM name	(Up to 240 alphanumeric characters)

> **NOTE:** The following characters are invalid or not recommended in the name: {space} + ~ , @ = ` [ ] { } < > ' " " ; : | \ and ?.

Symbol	Definition	Format
X31	= GMT date and time (for set)	In the format: *MM/DD/YY•HH:MM:SS where*:

MM = month: Ø1 (Jan) through 12 (Dec)
DD = day: Ø1 through 31
YY = year: ØØ through 99
HH = hour: ØØ through 23
MM = minutes: ØØ through 59
SS = seconds: ØØ through 59

Symbol	Definition	Format
X32	= Date and time (for read)	In the format: *Day,•DD•Mmm•YYYY•HH:MM:SS where*:

Day = weekday: Mon through Sun
DD = date: Ø1 through 31
Mmm = month: Jan through Dec
YYYY = year: 2ØØØ through 2Ø99
HH = hour: ØØ through 24
MM = minutes: ØØ through 59
SS = seconds: ØØ through 59

Symbol	Definition	Format
X33	= IP address	*nnn.nnn.nnn.nnn*
X34	= Password	12 alphanumeric characters
X35	= Hardware (MAC) address	*nn-nn-nn-nn-nn-nn*
X36	= Number of open connections	Ø – 255

Command and response table

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
Set ISM name (location)	Esc X30 CN ←	Ipn•X30 ↵	
Read ISM name (location)	ECN ←	X30 ↵	
Set GMT/date	Esc X31 CT ←	Ipt•X32 ↵	

> **NOTE:** The date and time entered should be Greenwich Mean Time (GMT).

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
Read GMT/date	Esc CT ←	X32 ↵	
Set IP address	Esc X33 CI ←	Ipi•X33 ↵	The switcher sends the response, but the host may not receive it.
Read IP address	ECI ←	X33 ↵	
Read hardware address	ECH ←	X35 ↵	
Read # of open connections	ECC ←	X36 ↵	
Set administrator password	Esc • X34 CA ←	Ipa•X34 ↵	
Read administrator password	Esc CA ←	X34 ↵	
Set user password	Esc • X34 CU ←	Ipu•X34 ↵	
Read user password	Esc CU ←	X34 ↵	

> **NOTE:** When the computer is connected to the switcher via the RS-232 link, the Admin and User password fields are not masked. If a password has been inadvertently changed to an unknown value, you can look up and, if desired, change a password in this window without knowing the current password.

Command and Response Table for Special Function SIS Commands

The syntax for setting a special function is X*n̲*X?̲# where X*n̲* is the value or variable (such as **35** in the first example below), X*n̲* is the function number (such as "set RGB delay" in the first example below), and # is the execute command. To view the setting of a function, use X?̲ # where X?̲ is the function number.

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
RGB delay			
RGB delay (Triple-Action Switching)	X20̲*3#	Dly X20̲ ↵	Switching delay of the selected input to the preview output. Adjustable in 0.01 second steps from Ø up to 5Ø = 5.0 seconds. Ø = 0.0 seconds (default), **1** = 0.1 seconds, **2** = 0.2 seconds, and so on.
Example:	35*3#	Dly35 ↵	RGB delay set to 3.5 seconds.
Scaler output settings			
Output sync format	X8̲*6#	Syn X8̲ ↵	ØØ = RGBHV (**default**) Ø1 = RGBS
Example:	1*6#	Syn1 ↵	RGBHV output signal.
Output polarity	X9̲*7#	Pol X9̲ ↵	X9̲: Horizontal/Vertical polarity
			Ø = H–/V– 2 = H+/V–
			1 = H–/V+ 3 = H+/V+
Example:	1*7#	Pol1 ↵	H–/V+ output polarity.
Blue screen			
Blue screen (blue & sync output only)	X3̲*8#	Blu X3̲ ↵	Ø = off (normal output).
			1 = on (blue video and sync output).
Example:	1*8#	Blu1 ↵	Blue and sync output for setup.
Edge smoothing			
Edge smoothing	X3̲*16#	Fil X3̲ ↵	ØØ = off Ø1 = on (**default**)
Example:	1*16#	Fil01 ↵	Enable edge smoothing.
Enhanced mode			
Enhanced mode	X3̲*12#	Enh X3̲ ↵	Ø = off. 1 = on.
Example:	1*12#	Enh01 ↵	Enable enhanced mode.
Auto Image			
Set Auto Image	X3̲*13#	Img X3̲ ↵	ØØ = off Ø1 = on
Example:	1*13#	Img01 ↵	Set Auto Image on.
Execute Auto Image	X18̲*14#	Img X18̲ ↵	X18̲: Auto Image input tied to output:
			Out 1/Out 2 **Out 1/Out 2**
			Ø1 = Yes/No Ø3 = Yes/Yes
			Ø2 = No/Yes
		X2̲Reconfig ↵	Output X2̲ Auto Image is complete.
		X2̲Reconfig ↵	Output X2̲ Auto Image is complete.

NOTES:

- If Auto Image adjustments are not necessary for an input, the X2̲Reconfig ↵ message may not be received.
- If both outputs are receiving the same input, both outputs are auto imaged regardless of the X18̲ received.

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
PAL film mode			
Set PAL film mode	X1̲*X3̲*18#	X1̲Flm X3̲ ↵	X3̲: Ø = off (**default**) 1 = on
Example:	8*1*18#	8Flm01 ↵	The ISM uses its 2:2 pulldown (PAL) video processing algorithms to scale input 8.
Read PAL film mode	X1̲*18#	X3̲ ↵	Ø = off 1 = on.

Command and Response Table for Advanced Instruction Set Commands

The advanced instruction set consists of four hexadecimal commands for uploading and downloading all or a portion of the memory of the switcher. These commands are for use by knowledgeable programmers, and result in a dump of data from (upload) or to (download) the switcher. Programmers can use the commands to exactly duplicate the settings among switchers with a minimum of effort.

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
Memory backup			
Read all memory contents	9Ø 91	{8226 data bytes+1 byte checksum}	Upload (switcher to control device) all color, tint, contrast, brightness, detail, sizing, and centering settings; all user presets; and all auto memories for all inputs and both outputs
Write all memory contents	9Ø 92+8226 data bytes+1 byte checksum Dn1↵		Download (control device to switcher) all color, tint, contrast, brightness, detail, sizing, and centering settings; all user presets; and all auto memories for all inputs and both outputs.
Read partial contents	X2 9Ø 93	{26 data bytes+1 byte checksum}	Upload (switcher to control device) color, tint, contrast, brightness, detail, sizing, and centering settings; all user presets; and all auto memories for the input selected for output X2.
Write partial contents	X2 9Ø 94+26 data bytes+1 byte checksum Dn1↵		Download (control device to switcher) color, tint, contrast, brightness, detail, sizing, and centering settings; all user presets; and all auto memories for the input selected for output X2.

Switcher Software

This section describes

- **Control Software for Windows®**
- **Button-Label Generator**

Control Software for Windows®

The Windows-based Extron ISSISM Control Program communicates with the switcher via the Ethernet LAN port or the rear panel Remote RS-232/RS-422 port to provide an easy way to set up and operate the switcher. The program is compatible with Windows 2000 and Windows XP. Updates to these programs can be downloaded from the Extron Web site (**http://www.extron.com**).

Installing the Software

The program is contained on the Extron Software Products DVD. Install the software as follows:

1. Insert the DVD into the drive. The installation program should start automatically. If it does not self-start, run Launch.exe from the DVD.

The Extron software DVD window appears (see figure 28).

Figure 28.   Software DVD Window

2. Click the `Software` tab (see figure 28, ①).

3. Scroll to the desired program and click `Install` (see figure 29).

+ ISS/ISM
Control software for ISM (ISC-612-end J (ISC-000-000)
ML Release Notes
29-054-02   1.9   Jun 23, 2006   4877 KB   Install

Figure 29.   Software Installation

4. Follow the on-screen instructions. By default, the installation of the installation routine creates a `C:\Program Files\Extron\ISSISM` directory, and it places the following five icons into a group folder named `Extron Electronics\ISSISM`:

- Button-Label Generator-

- Check for ISSISM Control Program Update

- ISSISM Control Program

- ISSISM Help

- Uninstall ISSISM Control Program

Software Operation via Ethernet

When an ISM is connected to an Ethernet WAN or LAN, any number of users can operate it, locally or remotely, using the ISS/ISM Control Program (see **Ethernet connection** on page 9 for installation details).

Connection to the switcher via the Ethernet is password protected. There are two levels of password protection: administrator and user. Administrators have full access to all ISM switching capabilities and editing functions. Users can select video and/or audio for output, select inputs and outputs, select test patterns, set RGB and audio mutes, select a blue screen, and view all settings with the exception of passwords. If the same passwords or no password is required for logging on, all personnel log on with administrator privileges. Fields and functions that exceed user privileges are grayed out in the ISS/ISM Control Program when the operator is logged on as a user.

Ethernet protocol settings

The IP Settings/Options screen (see **figure 35** on page 51) provides a location for observing and, if you are connected via the RS-232 link or if logged on via the Ethernet port as an administrator, editing settings unique to the Ethernet interface. None of the fields on this screen can be edited while you are logged on as a user. See **System Configuration Page** on page 67, for details on the contents of these fields. See **Ethernet Connection** on page 69 for other basic information about Internet protocol.

NOTE: Editing variables on the IP Settings/Options screen while connected via the Ethernet port can immediately disconnect the user from the ISM. Extron recommends editing the settings on this screen using the RS-232 link and protecting the Ethernet access to this screen by assigning an administrator's password to qualified and knowledgeable personnel only.

Using the Control Program

Many items found in the ISS/ISM Control Program are also accessible via front panel controls and the LCD menus (see the **Operation** section, starting on page 15), and under SIS control (see the **Programming Guide** section, starting on page 38). The ISS/ISM Help Program provides information on settings and on how to use the control program, itself.

1. To run the control program, click **Start > Programs > Extron Electronics > ISSISM.** The Comm menu appears on the screen (see figure 30).
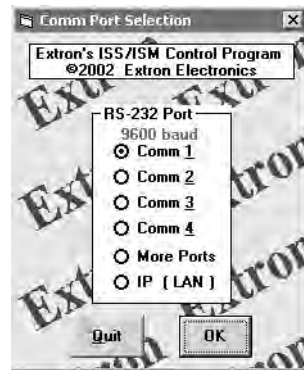

Figure 30.   Comm Port Selection Window

2. Select the comm port that is connected to the ISM's Remote port or select IP [LAN] and click **OK**.

    *   **If you selected a comm port**, proceed to step **5**.

    *   **If you selected IP [LAN]**, proceed to step **3**.

3. **If you selected IP [LAN] in step 2**, the IP connection window appears (see figure 31). The window displays the last IP address that this computer was logged on to via the ISS/ISM Control Program. If no one has logged on to the ISM from this computer, enter the ISM IP address. If the address has not been changed, the factory-specified default is 192.168.254.254.
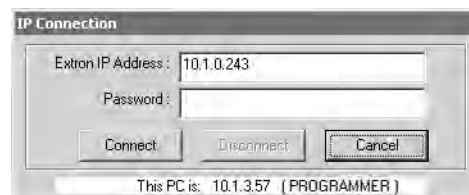

Figure 31.   Address and Password Entry

4. **If you selected IP [LAN] in step 2**, when prompted, enter the appropriate administrator or user password and click **Connect**.

    *   If you logged on using the administrator password, the program connects you to the ISM with all of the administrator rights and privileges.

    *   If you logged on using the user password, the program connects you to the ISM with only user capabilities.

    *   If an incorrect password was entered, the program beeps and returns to the password entry display.

    *   The Extron ISS/ISM Control Program window (see figure 32 on the next page) appears.

Figure 32.   Windows Control Program Window

5. If desired, on the task bar click **Tools** > **I/O Configuration** to configure the video inputs and outputs in the I/O configuration window (see figure 33).
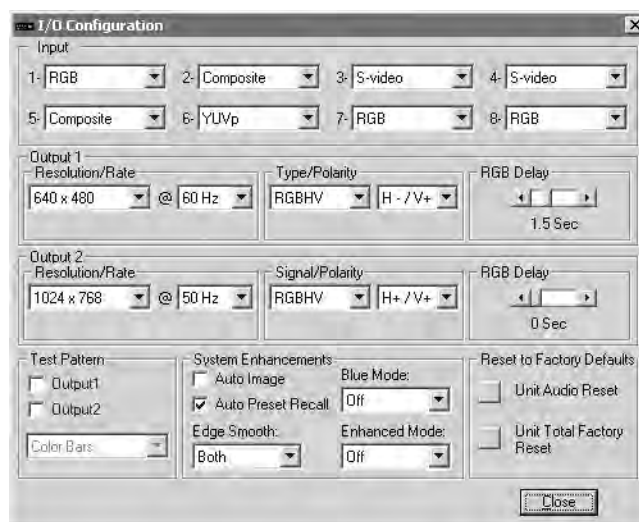

Figure 33.   Control Program I/O Configuration Window

6. If desired, on the task bar, click **Tools** > **Audio Settings** to set each input's audio level or attenuation in the Audio Settings window (see figure 34).
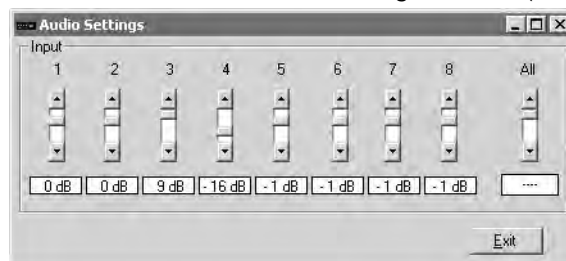

Figure 34.   Control Program Audio Settings Window

7. If desired, on the task bar, click **Tools > IP Options** to set the switcher's IP parameters in the IP Settings/Options window (see figure 35).
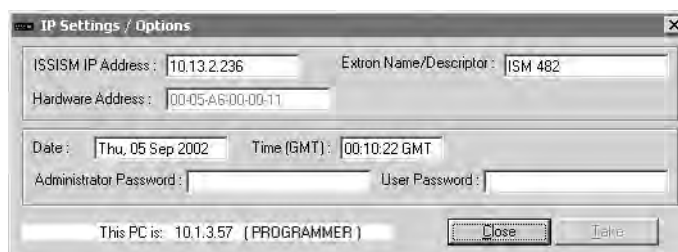

Figure 35. **Control Program IP Setting/Options Window**

> **NOTE:** When the control program is connected to the switcher via the RS-232 link, the Administrator and User password fields are not masked. If a password has been inadvertently changed to an unknown value, you can look up and, if desired, change a password in this window without knowing the current password.

Using the Help Program

For information on program features, press the F1 computer key; or click the Help menu from within the ISS/ISM Control Program; or double-click the ISS/ISM Help icon, shown at right, in the Extron Electronics group or folder.

For explanations of buttons or functions, click the tabs in the help screen to reach the desired screen. Use a mouse or the Tab and Enter keys to select a button/function. A description and tips on using the program appear on screen.

Button-Label Generator

You may wish to customize the labeling of the ISM's front panel buttons. Blank templates for the ISM's button label windows are included on **page 75**. However, you can easily create, customize, and print labels for the switcher's input label window by using the Button-Label Generator software. This program creates and prints labels that can be inserted into the input label window on the switcher.

Installing the Software

The program is included on the same CD-ROM as the ISS/ISM Control Program and is installed automatically when you install that program. It can also be downloaded from the Extron Web site (**www.extron.com**).

By default, the files are installed in either the `C:\ISSISM` directory, if installed automatically with the ISS/ISM Control Program, or the `C:\BUTTONS` directory if installed as a stand-alone program. The Button-Label Generator icon is placed in the "Extron Electronics" group or folder.

Using the Software

1. To run the Button-Label Generator program, click **`Start > Programs > Extron Electronics > Button-Label Generator`**. Extron's Button-Label Generator window appears (see figure 36).

2. Under Systems selection, choose ISS 408/ISM 482. This selection creates the correctly sized labels for the ISM's label strip. The button label editing area changes to reflect the number and arrangement of buttons on the device.
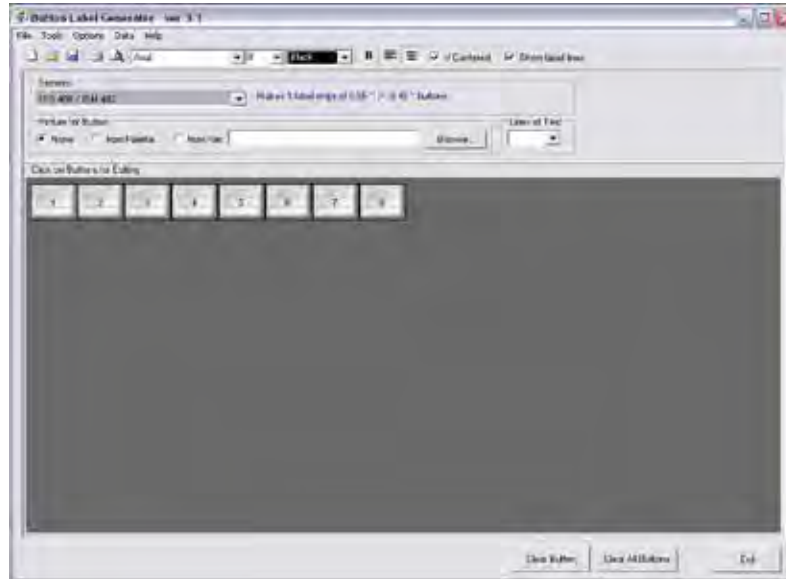
Figure 36.   The Extron Button-Label Generator Window

3. Using standard Windows controls, you can create and print labels that can be cut out and placed in the label windows on the front panel of the ISM.

   For information about using the program, you can access a help file by clicking on the **`Help`** menu on the main screen and choosing **`Show Help`**.

   You can also see an example of a completed Extron Button-Label Generator window by clicking the **`Help`** menu on the main screen, choosing **`Show Help`**, and clicking the **`Load Demo`** button.

HTML Operation

This section describes

- **Loading the Startup (Control) Page**
- **Control Page**
- **System Configuration Page**
- **File Management Page**
- **I/O Configuration Page**

The ISM 482 can be controlled and operated through its Ethernet port, connected via a LAN or WAN, using a Web browser such as the Microsoft® Internet Explorer®. This chapter describes the factory-installed HTML pages, which are always available and cannot be erased or overwritten.

> **NOTE:**   If your Ethernet connection to the ISM is unstable, try turning off the proxy server in your Web browser. In Internet Explorer, click `Tools > Internet Options > Connections > LAN Settings`, uncheck the "`Use a proxy server...`" box, and then click `Ok`.

Loading the Startup (Control) Page

Access the switcher using HTML pages as follows:

1. Start the Web browser program.
2. Click in the browser's Address field.
3. Type the switcher's IP address in the browser's Address field.

> **NOTE:**   If the value has not been changed, the factory-specified default, 192.168.254.254, is the correct value for this field.

4. If you want the browser to display a page other than the default page (such as a custom page that you have created and uploaded), enter a slash (**/**) and the name of the file to open.

> **NOTES:**
> - The browser's Address field should display the address in the following format: xxx.xxx.xxx.xxx/{optional_file_name.html}
> - The following characters are invalid in file names: {space} ~ @ = ' [ ] { } < > ' " ; : | \ and ?.

5. Press the keyboard Enter key. The switcher checks to see if it is password protected.
   - If the switcher is not password protected, proceed to **step 7**.
   - If the switcher is password protected, the Enter Network Password page (see figure 37 on the next page) appears.
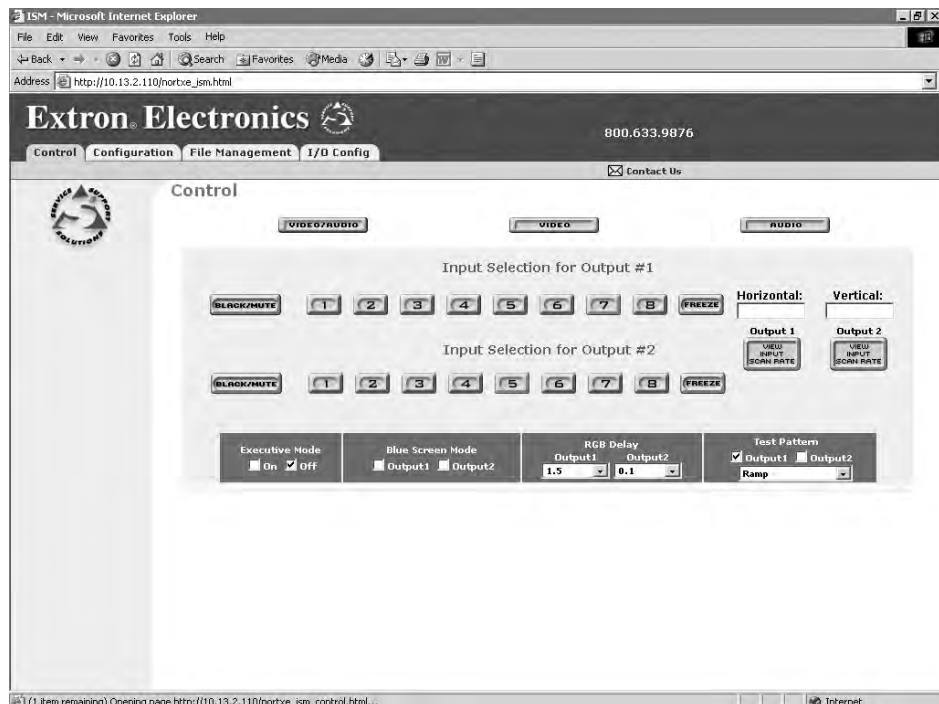
Figure 37. **Enter Network Password Page**

NOTE: A User Name entry is not required.

6. Click in the Password field and type in the appropriate administrator or user password.

7. Click the **OK** button. The switcher checks several possibilities, in the following order, and then responds accordingly.

   a. Does the address include a specific file name, such as 10.13.156.10/file_name.html? **If so**, the switcher downloads that HTML page.

   b. Is there a file in the switcher's memory that is named "index.html"? **If so**, the switcher loads "index.html" as the default startup page.

   c. **If neither of the above conditions is true**, the switcher loads the factory-installed default startup page, "nortxe_index.html" (see figure 38), also known as the Control page.

Figure 38. **Control Page**

Control Page

On the Control page (see figure 38), you can select an input to either or both outputs. The Control page also provides facilities to check the frequency of an input and to mute outputs. Access the Control page by clicking the `Control` tab.

Creating a Tie

Select and switch an input to an output as follows:

1. Click the `Video/Audio`, `Video`, or `Audio` button to select both the video and audio planes, the video plane only, or the audio plane only for switching (audio follow or audio breakaway).

2. Select an input for output 1 or output 2 by clicking the desired input button for either output 1 or output 2. After the RGB delay, the selected input is displayed on the designated monitors. The selected input button turns blue to indicate a video and audio or video only selection, or yellow to indicate an audio only selection. The RGB delay is user-selectable (see "Changing the RGB delay," below).

Changing the RGB Delay

The RGB delay interval for each output defines how long the screen is blanked when you are selecting a new input for the connected monitor.

Change the RGB delay for an output as follows:

1. Click in the RGB Delay field for the desired output. A drop-down scroll box appears (see figure 39).
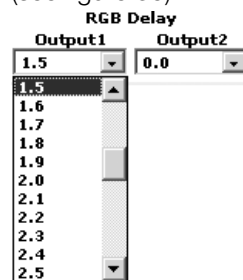
Figure 39.   RGB Delay Scroll Box

2. Click and drag the slider or click the scroll up (▲) or scroll down (▼) button until the desired interval is visible.

3. Click the desired interval.

Blacking out the Screen and Muting the Audio

You can mute the video (blackout the screen) and/or audio to output 1 and/or output 2 from the control page as follows:

1. Click the `Video/Audio`, `Video`, or `Audio` button to select both the video and audio planes, the video plane only, or the audio plane only for muting.

2. Click the Output 1 or Output 2 `Black/Mute` button. The `Black/Mute` button turns blue to indicate a video and audio mute or video only mute, or it turns yellow to indicate audio mute. If you muted the output that is selected on the front panel, the front panel Black and/or Mute LEDs light.

   Click the `Black/Mute` button again to unmute the video and/or audio.

Freezing the Output

You can freeze either output by clicking the Output 1 or Output 2 **Freeze** button. The **Freeze** button turns blue. When the output is frozen, the input source can be removed and the ISM functions as a video store.

Click the **Freeze** button again to toggle freeze mode off.

Outputting a Test Pattern

You can select a test pattern to output on the output 1 and/or output 2 monitors. The test patterns are helpful when adjusting the connected displays for color, convergence, focus, resolution, contrast, grayscale, and aspect ratio.

Output a test pattern as follows:

1. Click in the **Test Pattern** field. A drop down-box appears (see figure 40).

Figure 40. **Test Pattern Drop Box**

2. Click the desired test pattern.

3. Click the Output 1 and/or Output 2 check box to turn on the test pattern.

Previewing the Scan Rate

You can read the horizontal and vertical scan rates of output 1 and output 2 by clicking the Output 1 or Output 2 **View Input Scan Rate** button. The horizontal and vertical frequencies are displayed in the Horizontal and Vertical windows on the page.
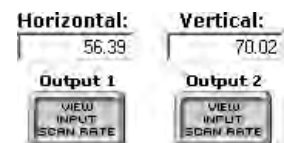
Using Blue-Only Mode

You can toggle Blue-Only mode on and off for either output by clicking the **Blue Screen Mode Output 1**, **Output 2**, or both check boxes. Blue-Only mode is helpful in the setup of the color and tint of the incoming video signal. In the Blue-Only mode, only the sync and blue video signals are passed to the display.

Executive Mode

You can toggle Executive mode on and off by clicking the Executive Mode **On** or **Off** check box. The Executive mode limits the operation of the Integration Scaling Matrix Switcher from the front panel. When the switcher is in Executive mode, all of the front panel functions are disabled except for input selection.

System Configuration Page

The ISM downloads the System Configuration page (see figure 41) when you click the `Configuration` tab. The screen consists of fields in which you can observe and edit IP administration and system settings.
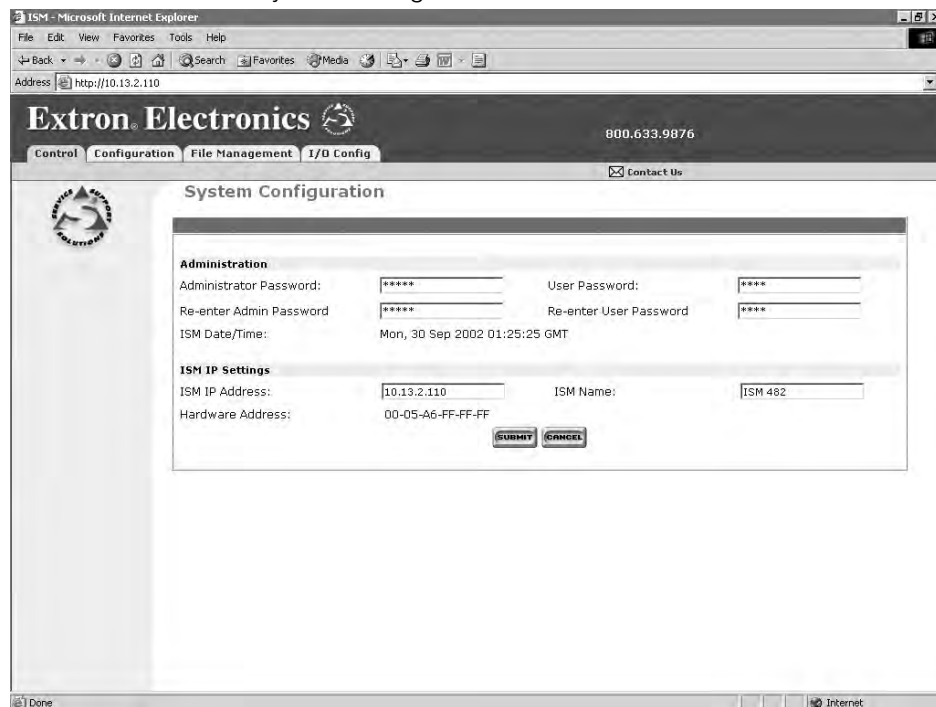
Figure 41. System Configuration Page

> **NOTE:** Access to the ISM settings using Web control is **_not_** password protected. Ensure only knowledgeable and qualified personnel have access to the switcher under Web control.

Administration Fields

The administration fields on the System Configuration page are for entering and verifying administrator and user passwords.

- Ethernet connection to the switcher, either by entering SIS commands via Telnet (see the **Programming Guide** section on page 32) or using the control program (see the **Switcher Software** section on page 48) is password protected.

- Connection via Web pages and connection via the RS-232 port are **not** password protected.

Administrators have full access to all ISM switching capabilities and editing functions. Users can select video, audio, or both for output, select test patterns, set RGB and audio mutes, select a blue screen, and view all settings except passwords.

The administration fields on the System Configuration page are for entering and verifying administrator and user passwords. Passwords are case sensitive and are limited to 12 upper case and lower case alphanumeric characters. Each password must be entered twice: once in the password field and then repeated in the re-enter password field. Characters in these fields are masked by asterisks (*****). If you do not want to password-protect an access level, leave the password field and the re-enter password field blank. After entering the desired password in both fields, click the `Submit` button.

NOTES:

- The program will not allow you to create a user password unless you have already created an administrator password.

- If a password has been inadvertently changed to an unknown value, you can still connect to the switcher via the RS-232 link, which is not password protected. When connected via the RS-232 link, using either SIS commands (see the **Programming Guide** section on page 31) or under program control (see the **Switcher Software** section on page 51), you can look up and, if desired, change a password.

ISM IP Settings Fields

The ISM IP Settings fields provide a location for observing and editing settings unique to the Ethernet interface. After editing any of the settings on this page, click the `Submit` button.

ISM IP Address field

The ISM IP Address field contains the IP address of the connected ISM. This value is encoded in the flash memory on the controller circuit board.

Valid IP addresses consist of four 1-, 2-, or 3-digit numeric subfields separated by dots (periods). Each field can be numbered from 000 through 255. Leading zeroes, up to 3 digits total per field, are optional. Values of 256 and above are invalid.

The default address is 192.168.254.254, but if this conflicts with other equipment at your installation, you can change the IP address to any valid value.

ISM Name field

The ISM Name field contains the name of the switcher. This is helpful in identifying the switcher in multiple-unit networks. This name field can be changed to any valid name, up to 12 alphanumeric characters.

Hardware Address field

The hardware address (also known as the MAC address) is hardcoded on the controller board and cannot be changed.

File Management Page

To delete files such as HTML pages from the ISM or to upload your own files to the ISM, click the **File Management** tab. The switcher downloads the file management Web page (see figure 42).

To delete a file, check the associated **Delete** check box and click the **Delete Files** button.

Upload your own files as follows:

1.   Click the **Browse** button.

2.   Browse through your system and select the desired file.

3.   Click the **Upload File** button.

I/O Configuration Page

You can set up the input configurations and the output format on the I/O Configuration page (see figure 43). Access the Setup page by clicking the `I/O Config` tab.
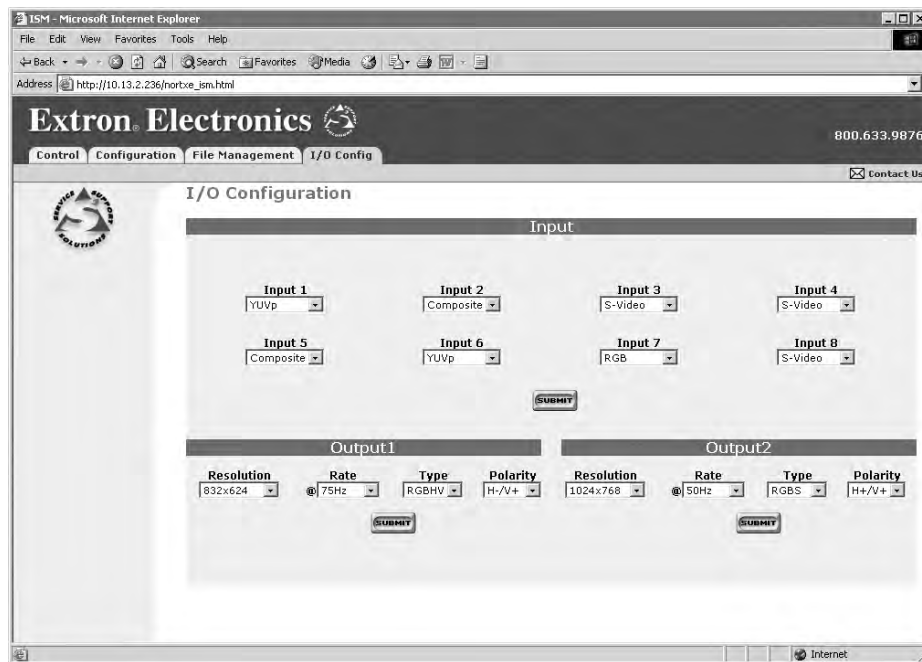
Figure 43. **I/O Configuration Page**

Input Configuration

You can specify the format of each input. The available formats are RGB, RGBcvS (identified as RGBcS in the drop-down box), YUVi, YUVp, Betacam 50, Betacam 60, HDTV, S-video, and composite video. Specify the input format as follows:

1. Click in the desired Input Configuration field. A drop-down box appears (see figure 44).

Figure 44. **Input Configuration Drop Box**

2. Click the desired input format.

3. Click the `Submit` button.

Output Resolution, Rate, Sync Format, and Polarity

The ISM 482 scales the input signal up or down to any of a number of output resolutions and rates. The switcher outputs the scaled video as RGBHV or RGBS, with user-selectable polarity, via either the program or preview connectors. The table below shows the resolutions and rates available on the ISM 482.

Resolution	50 Hz	56 Hz	60 Hz	75 Hz	85 Hz	Lock at 50/60 Hz†	Actual DVI output
640 x 480	●		●	●		●	1024 x 480
800 x 600	●		●	●		●	1024 x 600
832 x 624			●	●		●	1024 x 624
848 x 480			●			●	1024 x 480
852 x 480			●			●	1024 x 480
1024 x 768*	●		●	●	●	●	1024 x 768
1280 x 768*	●	●	●			●	1280 x 768
1200 x 800*	●		●			●	1200 x 800
1280 x 1024*	●		●				1280 x 1024
1360 x 765*			●			●	1360 x 765
1365 x 768*	●		●			●	1365 x 768
1366 x 768*			●			●	1366 x 768
1365 x 1024			●			●	1280 x 1024
1400 x 1050*	●		●			●	1400 x 1050
576p HDTV*	●					●	720 x 576
720p* HDTV @ 60 Hz only			●			●	1280 x 720
1080p HDTV @ 60 Hz only			●			●	1280 x 1080
1080i HDTV	●		●			●	1280 x 540

* Native DVI output resolution
† The output refresh rate is auto-selected, based on the video refresh rate of input 1.

NOTES:

- For output resolutions with less than 1024 pixels horizontally, the optional DVI output's true horizontal resolution is limited to 1024 pixels. The vertical resolution is the selected vertical resolution. For these resolutions, the ISM DVI output is 1024 x {selected vertical size}. For example, if the output resolution is set to 640 x 480, the actual resolution of the DVI output card is 1024 × 480.

- For the 1365 x 1024, 1080p, and 1080i output resolutions, the optional DVI output's true horizontal resolution is limited to 1280 pixels. For these resolutions, the ISM DVI output is 1280 x {selected vertical size}. For example, if the output resolution is set to 1080p, the actual resolution of the DVI output card is 1280 x 1080.

- The DVI card outputs all other selected resolutions normally.

- Resolutions marked with an asterisk (*) in the table above are native DVI outputs, meaning that the DVI output fully supports the selected horizontal and vertical resolution. The DVI output resolution for these rates exactly matches the analog resolution.

Output resolution

Select the output resolution as follows:

1. Click in the `resolution` field. A drop-down scroll box appears (see figure 45).
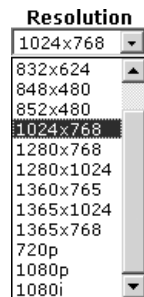
Figure 45. Resolution Scroll Box

2. Click and drag the slider or click the scroll up (▲) or scroll down (▼) button until the desired rate is visible.

3. Click the desired output.

4. Click the `Submit` button.

Output rate

Select the output rate as follows:

1. Click in the `Rate` field. A drop down box appears (see figure 46).
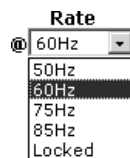
Figure 46.   Rate @ Drop Box

2. Click the desired output frequency.

   Frequencies that are not available for a specific resolution are marked N/A in the Rate @ drop box.

   The drop box selection `Locked` enables the Extron Accu-RATE Frame Lock (AFL™) feature. Accu-RATE Frame Lock eliminates image tearing and other artifacts of scaling motion video by eliminating frame rate conversion. It exactly matches the output rate of the ISM to the frame rate of the input 1. Select this feature if you will be using motion video sources with a display that is capable of a variety of refresh rates.

3. Click the `Submit` button.

Output format

Select between separate horizontal (H) and vertical (V) sync or composite s sync as follows:

1. Click in the `Type` field. A drop-down box appears (see figure 47).

Figure 47.   Type Drop Box

2. Click the desired sync type.

3. Click the `Submit` button.

Output polarity

Select the output polarity as follows:

1. Click in the Polarity field. A drop-down box appears (see figure 48).

Polarity

H-/V-	▾
H-/V-	
H-/V+	
H+/V-	
H+/V+	
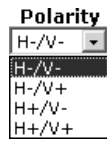
Figure 48. Polarity Drop Box

2. Click the desired output sync polarity.
3. Click the **Submit** button.

Maintenance and Modifications

This section describes:

- **Opening and Closing the Switcher**
- **Installing a Firmware Upgrade**
- **Installing a DVI Output Card**

Opening and Closing the Switcher

NOTE: Extron recommends that you send the unit in to Extron for service and updates.

To replace the firmware or install the optional DVI output card, you need to open the ISM's case. Open and close the switcher as follows:

1. Disconnect the AC power cord from the ISM to remove power from the unit.

    CAUTION: **Electric shock hazard**. To prevent electric shock, always unplug the ISS from the AC power source before opening the enclosure.

2. If the ISM is installed in a rack, disconnect all signal and control cables and remove the ISM from the rack.

3. Remove the 16 screws, 8 on the top and 4 on each side of the ISM cover (see figure 49 on the next page).
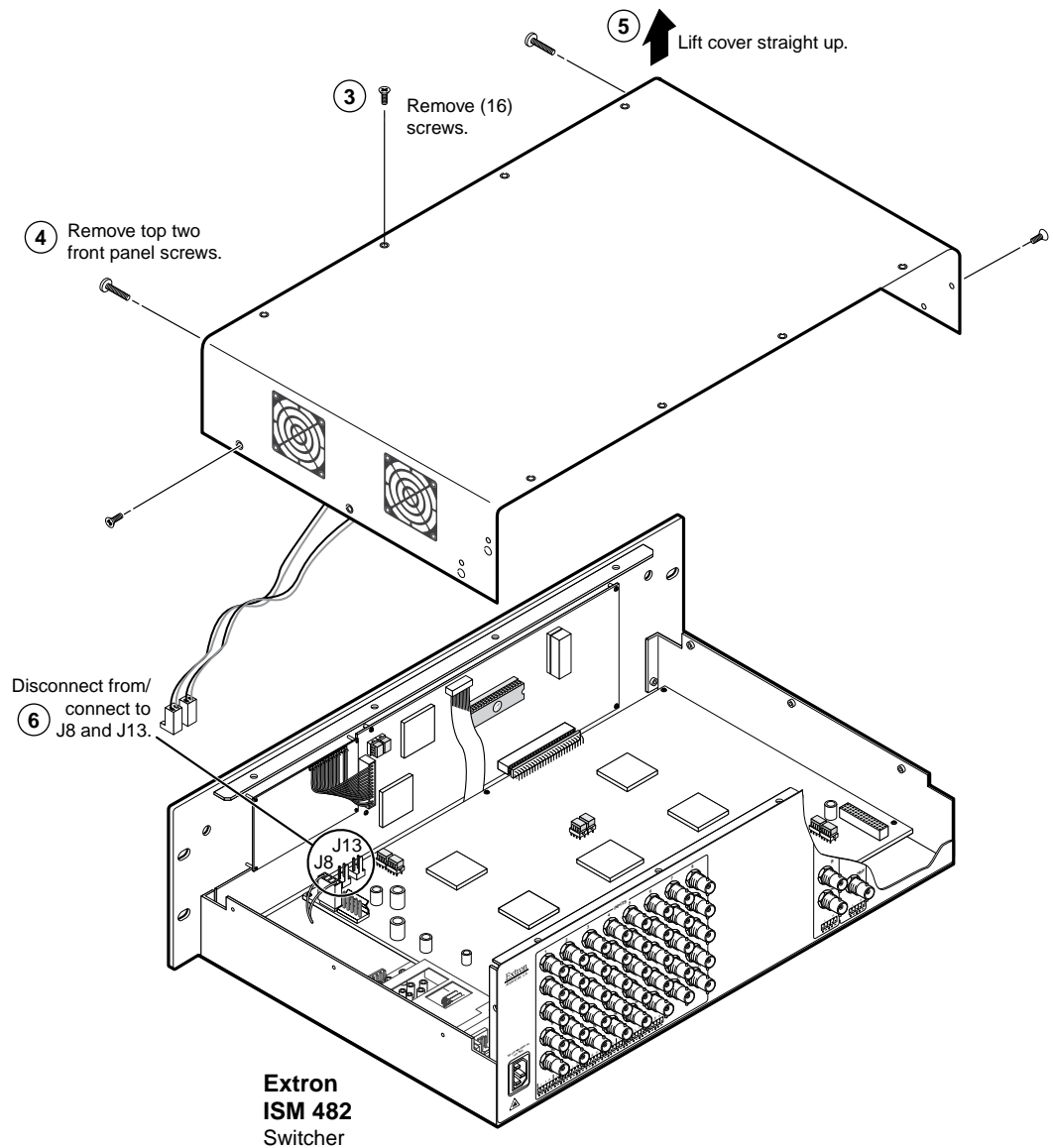
Figure 49.   Removing the ISM Cover

4.   Remove the top two front panel screws.

5.   Lift the top cover straight up approximately 5 inches until you can access the fan power cords.

> **ATTENTION:**   Do not touch any switches or other electronic components inside the ISM. Doing so could damage the switcher. Electrostatic discharge (ESD) can damage IC chips even though you cannot feel it. You must be electrically grounded before proceeding with firmware replacement. A grounding wrist strap is recommended.

6.   Disconnect the two fan power cords from connectors J8 and J13 on the main board.

7.   Lift the top cover out of the way.

8.   Perform the desired maintenance procedure (see "Installing a Firmware Upgrade" on the next page or **Installing a DVI Output Card** on page 67).

9.   Reconnect the two fan power cords to connectors J8 and J13 on the main board. It does not matter which fan is connected to which connector.

10. Replace the top cover on the ISM.

11. Fasten the top cover with the screws that were removed in step 3 and step 4.

12. Rack mount the switcher if desired and reconnect all cables.

Installing a Firmware Upgrade

In some cases the ISM firmware may require replacement with an updated version. There are nine user-replaceable firmware chips (see figure 50): U1, U2, and U6 on the front panel circuit board and U98, U99, U100, U101, U102, and U103 on the main circuit board. The U-numbers are printed on the circuit boards. Extron recommends that you send the unit in to Extron for service and updates.

U102
U103

U6

U1
U2

U98
U99

U100
U101

**Extron
ISM 482**
Switcher
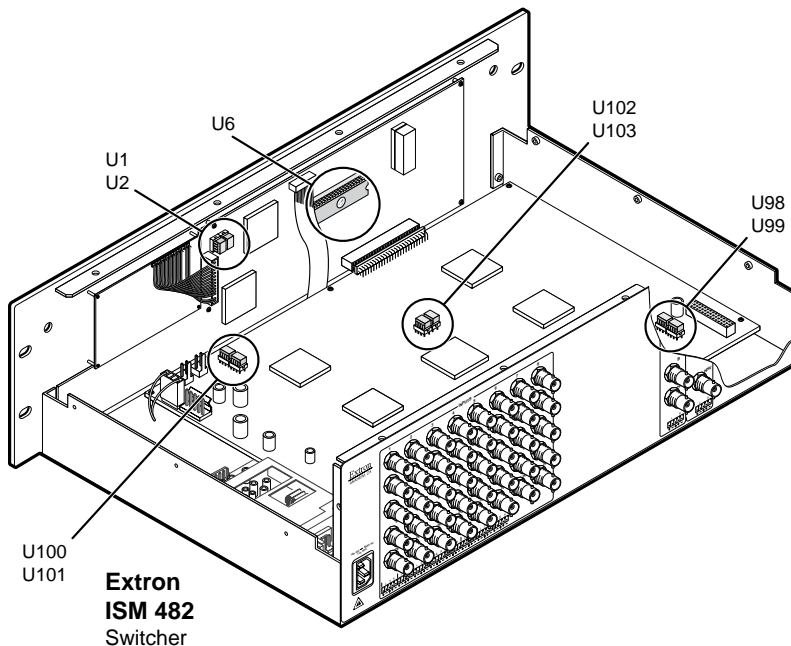
Figure 50.   ISM Firmware Chip Locations

• Chips U1 and U2 are replaced as a pair.

• Chip U6 is replaced alone.

• Chips U98, U99, U100, and U101 are replaced as a set.

• Chips U102 and U103 are replaced as a pair.

> **ATTENTION:**   Changes to firmware must be performed by authorized service personnel only. Some ISM firmware updates must be performed at the Extron factory.

Replace firmware in the ISM as follows:

> **CAUTION: Electric shock hazard**. To prevent electric shock, always unplug the ISS from the AC power source before opening the enclosure.

1. Open the switcher (see **Opening and Closing the Switcher** on page 64).

2. Locate the firmware chips to be replaced on the main or front panel circuit board (see figure 50).

3. After you are electrically grounded, use a DIP chip puller to grasp each IC chip and pull it out of the sockets.

4. Align the slots of each new firmware chip with the angled corners of the socket in the same orientation as the old chip. Gently, but firmly, press the chip into place in the socket.

5. Close the switcher (see "Opening and Closing the Switcher," starting with **step 9** on page 65).

Installing a DVI Output Card

You can install an optional digital visual interface (DVI) output card in the ISS. With the card installed, a additional DVI video output 1 on a standard DVI connector. The DVI output is the video tied to output 1 and is in addition to the standard output 1 RGB video on BNC connector and 15-pin HD connectors. Extron recommends that you send the unit to Extron for service and updates.

Install an optional DVI output card in the ISM as follows:

> **ATTENTION:**   Changes to electronic components must be performed by authorized service personnel only.

> **CAUTION:**   **Electric shock hazard**. To prevent electric shock, always unplug the ISS from the AC power source before opening the enclosure.

1. Open the switcher (see **Opening and Closing the Switcher** on page 64).

> **ATTENTION:**   Do not touch any switches or other electronic components inside the ISM. Doing so could damage the ISM. Electrostatic discharge (ESD) can damage IC chips even though you cannot feel it. You must be electrically grounded before proceeding with any electronic component replacement. A grounding wrist strap is recommended.

2. Locate the DVI output card connector opening on the rear panel and the DVI output card connector J14. When viewed from the front, connector J14 is in the far left corner of the main circuit board (see figure 51).

DVI Output Card Connector Opening in ISM Rear Panel

DVI Output Card Connector J14 on Main Circuit Board
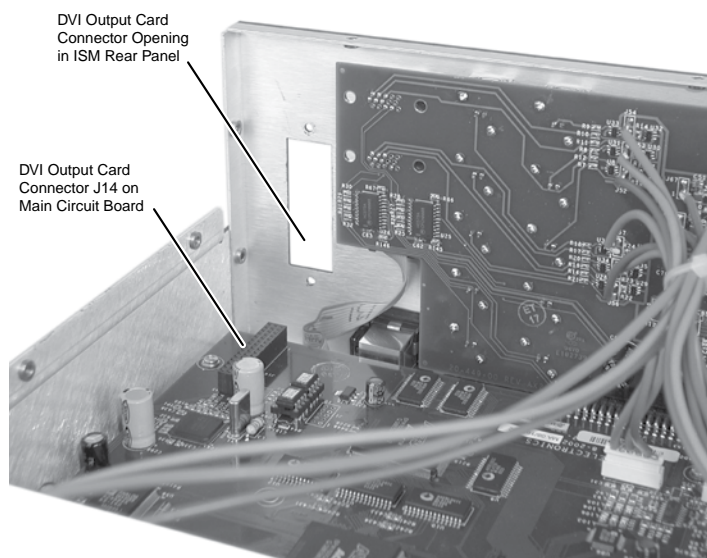
Figure 51.   **DVI Output Card Connector Opening and Socket J14**

3. If the rear panel DVI connector opening is still covered, remove the two screws that secure the cover to the back panel and remove the cover.

4. Position the DVI card above connector J14 with the DVI connector facing toward the rear of the switcher. Ensure that the pins on the DVI card properly align with the J14 connector to prevent bending the pins.

5. Carefully mate the 45-pin connector on the DVI output board with connector J14 on the main circuit board (see figure 52).
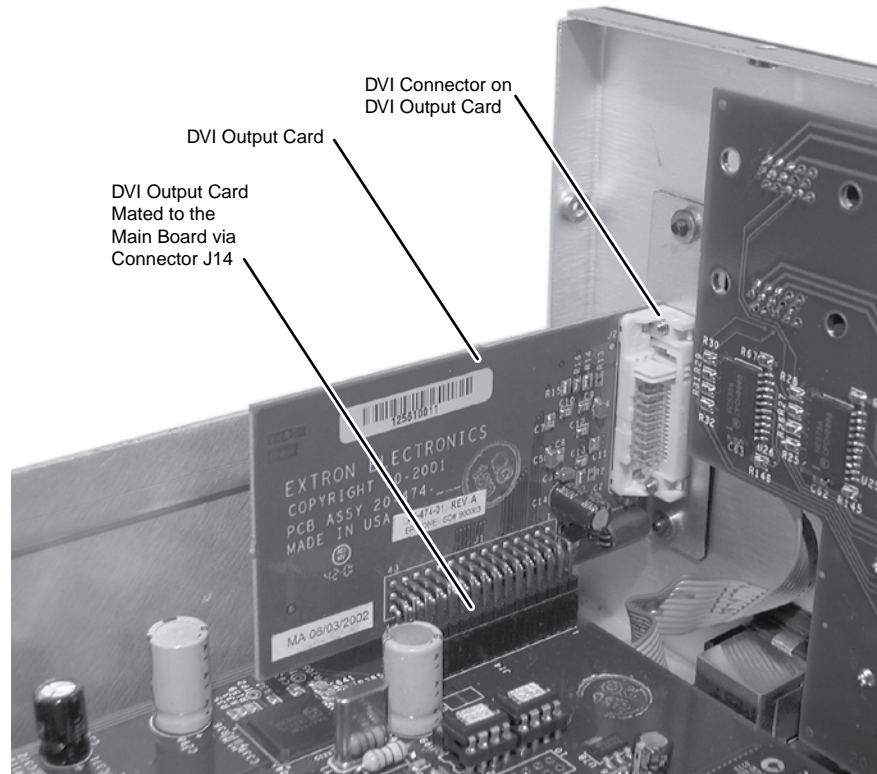
Figure 52.   Output DVI Board Installation

6. Secure the DVI card to the rear panel with the two screws removed in step 3.

7. Close the switcher (see "Opening and Closing the Switcher," starting with **step 9** on on page 65).

Ethernet Connection

This section describes:

- **Cabling**
- **Determining Default Addresses**
- **Connecting as a Telnet Client**

The rear panel Ethernet connector (see figure 53) on the ISM switcher can be connected to an Ethernet LAN or WAN. This connection makes SIS control of the switcher possible using a computer connected to the same LAN.

Cabling

The Ethernet cables can be terminated as straight-through cables or crossover cables (see figure 53) and must be properly terminated for your application:

- **Patch (straight) cable** — Connection of the ISM to an Ethernet hub, router, or switcher that also hosts a controlling computer
- **Crossover cable** — Direct connection between the ISM and a controlling computer

Pins:
1 2 3 4 5 6 7 8

Insert Twisted Pair Wires

RJ-45 Connector

Crossover Cable

Pin	End 1 Wire color	End 2 Wire color
1	White-green	White-orange
2	Green	Orange
3	White-orange	White-green
4	Blue	Blue
5	White-blue	White-blue
6	Orange	Green
7	White-brown	White-brown
8	Brown	Brown
	T568A	**T568B**

A cable that is wired as T568A at one end and T568B at the other (Tx and Rx pairs reversed) is a "crossover" cable.

Straight-through Cable

Pin	End 1 Wire color	End 2 Wire color
1	White-orange	White-orange
2	Orange	Orange
3	White-green	White-green
4	Blue	Blue
5	White-blue	White-blue
6	Green	Green
7	White-brown	White-brown
8	Brown	Brown
	T568B	**T568B**

A cable that is wired the same at both ends is called a "straight-through" cable, because no pin/pair assignments are swapped.
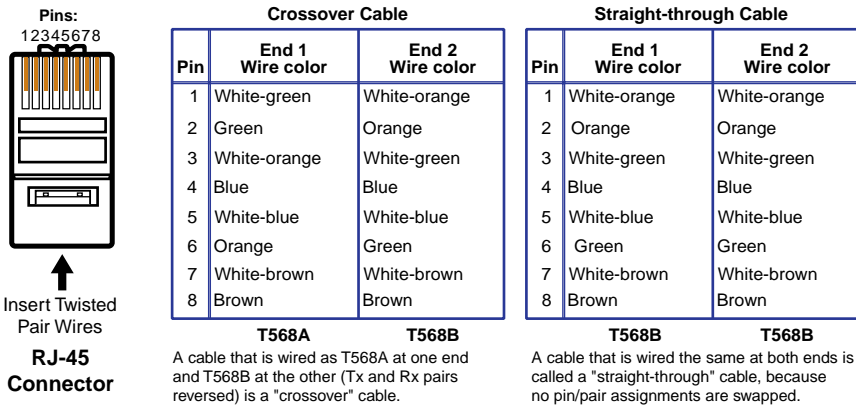
Figure 53.   **RJ-45 Connector Pinout Tables**

Determining Default Addresses

To access the ISM switcher via the Ethernet port, you need the Extron ISM IP address. If the address has been changed to an address comprised of words and characters, the actual numeric IP address can be determined using the Ping utility. If the address has not been changed, the factory-specified default is 192.168.254.254.

Ping can also be used to test the Ethernet link to the ISM.

Pinging to Determine the Switcher IP Address

The Microsoft Ping utility is available at the DOS prompt. Ping tests the Ethernet interface between the computer and the ISM. Ping can also be used to determine the actual numeric IP address from an alias and to determine the Web address.

Access the DOS prompt and ping the switcher as follows:

1. Click **Start > Run**.

2. At the Open prompt, type `command`.

3. Click the **OK** button.

4. At the DOS prompt, type `ping {IP address}` and press the keyboard Enter key (Enter). The computer returns a display similar to figure 54.

   The line **Pinging ...** reports the actual numeric IP address, regardless of whether you entered the actual numeric IP address or an alias name.

```
C:\>ping 192.168.254.254

Pinging 192.168.254.254 with 32 bytes of data:

Reply from 192.168.254.254: bytes=32 time<10ms TTL=128
Reply from 192.168.254.254: bytes=32 time<10ms TTL=128
Reply from 192.168.254.254: bytes=32 time<10ms TTL=128
Reply from 192.168.254.254: bytes=32 time<10ms TTL=128

Ping statistics for 192.168.254.254:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Figure 54.   Ping Response

Pinging to Determine the Web IP Address

The Ping utility has a modifier, `-a`, that directs the command to return the Web address rather than the numeric IP address.
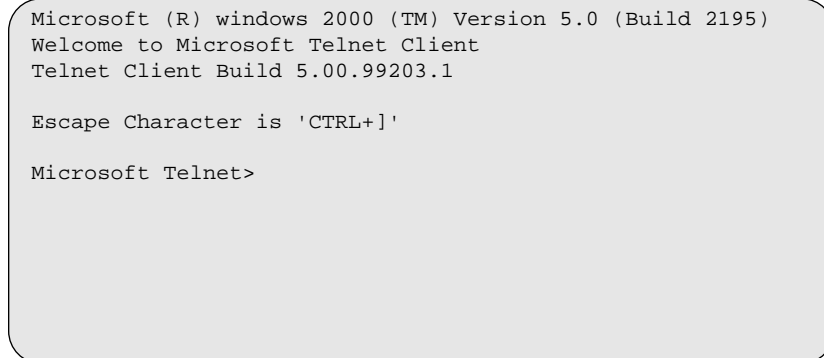
At the DOS prompt, type `ping -a {IP address}` and then press Enter. The computer's return display is similar to the Ping response shown in figure 54, except that when you specify the `-a` modifier, the line **Pinging mail...** reports the Web IP address rather than the numeric IP address, regardless of whether you entered the actual numeric IP address or an alias name.

Connecting as a Telnet Client

The Microsoft Telnet utility is available from the DOS prompt. Telnet allows you to input SIS commands to the ISM from the PC via Ethernet.

Access the DOS prompt and start Telnet as follows:

1. Click **Start > Run**.

2. At the Open prompt, type `command`.

3. Click the **OK** button.

4. At the DOS prompt, type `telnet` and press Enter. The computer returns a display similar to figure 55.

```
Microsoft (R) windows 2000 (TM) Version 5.0 (Build 2195)
Welcome to Microsoft Telnet Client
Telnet Client Build 5.00.99203.1

Escape Character is 'CTRL+]'

Microsoft Telnet>
```

Figure 55.   Telnet Screen

Telnet Tips

It is not the intention of this manual to detail all of the operations and functionality of Telnet; however, some basic level of understanding is necessary for operating the ISS via Telnet.

Open

Connect to the ISM using the Open command. Once you are connected to the switcher, you can enter the SIS commands the same way that you would if you were using the RS-232 link.

Connect to the ISM as follows:

1. At the Telnet prompt, type open {IP address} and then press Enter.

   • **If the switcher is not password protected**, no further prompts are displayed until you break or disconnect the connection to the ISM.

   • **If the switcher is password protected**, Telnet displays the password prompt.

2. If necessary, at the password prompt, type the appropriate password and then press Enter.

   Connection to the switcher via the Ethernet can be password protected. There are two levels of password protection: administrator and user. A person logged on as an administrator has full access to all ISM switching capabilities and editing functions. Users can select video and/or audio for output, select test patterns, set RGB and audio mutes, select a blue screen, and view all settings with the exception of passwords. By default, the ISM is shipped with no password assigned.

   Once you are logged in, the ISM returns either **Login Administrator** or **Login User**. No further prompts are displayed until you break or disconnect the connection to the ISM.

Escape character and Esc key

When Telnet is first started, the utility advises that the **Escape character is 'Ctrl+]'**. Many SIS commands include the keyboard ⎋Esc key. Consequently, some confusion may exist between the Escape character and the Escape key.

The Telnet Escape character is a key combination, the ⎇Ctrl key and the ⎀] key pressed simultaneously, that returns you to the Telnet prompt while leaving the connection to the ISM intact.

The Escape key is the ⎋Esc key on the computer keyboard.

Local echo

Once the computer is connected to the ISM, by default Telnet does not display your keystrokes on the screen. SIS commands are typed in blindly and the SIS responses are displayed on the screen. To command Telnet to show keystrokes, type `set local_echo` at the Telnet prompt, and then press ⏎Enter before you open the connection to the switcher.

With local echo turned on, keystrokes and the switcher's response are displayed on the same line. For example: `1*1!In1 Out1 All,` where `1*1!` is the SIS command and **In1 Out1 All** is the response.

With local echo turned on, all keystrokes are displayed, even those that should be masked, such as the password entry. For example, when entering a password with local echo turned on, you see a display such as **a*d*m*i*n***, where **admin** is the keyed in password and ***** is the masked response.

Local echo can be turned off by typing `unset local_echo` and then pressing ⏎Enter at the Telnet prompt. If you are connected to the ISM and need to access the Telnet prompt to turn local echo off, type the Escape character (⎇Ctrl+⎀]).

Set carriage return-line feed

Unless commanded otherwise, Telnet transmits a line feed character only (no carriage return) to the connected ISM when you press the ⏎Enter key. This is the correct setting for SIS communication with the switcher. The Telnet `set crlf` command forces Telnet to transmit carriage return and line feed characters when ⏎Enter is pressed, but if crlf is set, the SIS link with the switcher does <u>not</u> function properly. Do <u>not</u> set crlf on. If necessary, issue the `unset crlf` command to turn off crlf.

Close

To close the link to the switcher, access the Telnet prompt by typing the Escape character (⎇Ctrl+⎀]). At the Telnet prompt, type `close` and then press ⏎Enter.

Help

For Telnet command definitions, at the Telnet prompt, `type ?` and then press ⏎Enter.

Quit

Exit the Telnet utility by typing `quit` and then press ⏎Enter at the Telnet prompt. If you are connected to the ISM, access the Telnet prompt beforehand by typing the Escape character (⎇Ctrl+⎀]).

Reference Information

This section includes:

- **Part Numbers**
- **Button Labels**

Part Numbers

Included Parts

These items are included in each order for an ISM 482:

Included Parts	Part Number
ISM 482	60-425-01
Rubber feet (self-adhesive) (4)	
IEC power cord	
Tweeker (small screwdriver)	
ISM 482 Setup Guide	
Extron Software Products DVD (ISS/ISM Control Program and Button-Label Generator)	

Optional Accessories

Part	Part Number
DVI output card	70-244-01
Captive screw audio connector (5 pole, no tail, pkg of 10)	100-460-01
RCAF-BNCM (RCA-to-BNC adapters), pkg of 10	100-229-01
SVHSM-BNCF 8" (S-video to BNC adapter)	26-353-01

Cables and Connectors

When using signals with a scanning frequency of 15-125 kHz and running distances of 100 feet or more, use high resolution BNC cables to achieve maximum performance.

Bulk cable

Extron Part RG6/Super High Resolution Cable	Part Number
RG6 bulk , 500' (150m), single conductor	22-098-02
RG6-1 bulk , 1000' (300m), single conductor	22-098-03

MHR-5 Cable (Non-plenum)	Part Number
MHR-5 bulk, 500' (150m)	22-020-02
MHR-5 bulk, 1000' (300m)	22-020-03

MHR-5p (Plenum) Cable	Part Number
MHR-5P bulk, 500' (150m)	22-103-02
MHR-5P bulk, 1000' (300m)	22-103-03

Assorted connectors

BNC Connectors	Part Number
BNC male, mini HR crimp connectors, qty. 50	100-250-01
BNC male RG6 crimp connectors, qty. 50	100-260-01

Pre-cut cables

MHR-5 cable is used for RGBHV cable runs. It can also be used for composite video, S-video, or RGsB. All Extron BNC cables have male connectors on both ends. A plenum version of the MHR cable is also available.

MHR-5 Cable	Part Number
MHR-5 BNC (6' /1.8 meters to 300' /90.0 meters)	26-260-*xx*

NOTE: Bulk cable in lengths up to 5000 feet (1524 meter) rolls is available with or without connectors.

Button Labels

Eight sets of button labels are provided on the next page. If desired, cut them out of the manual, write the applicable button information in each button area, and place them in the switcher's label window.

Extron Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

USA, Canada, South America,
and Central America:
Extron Electronics
1230 South Lewis Street
Anaheim, CA 92805
U.S.A.

Europe and Africa:
Extron Europe
Hanzeboulevard 10
3825 PH Amersfoort
The Netherlands

Asia:
Extron Asia
135 Joo Seng Road, #04-01
PM Industrial Bldg.
Singapore 368363
Singapore

Japan:
Extron Electronics, Japan
Kyodo Building, 16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan

China:
Extron China
686 Ronghua Road
Songjiang District
Shanghai 201611
China

Middle East:
Extron Middle East
Dubai Airport Free Zone
F12, PO Box 293666
United Arab Emirates, Dubai

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions, or if modifications were made to the product that were not authorized by Extron.

> **NOTE:** If a product is defective, please call Extron and ask for an Application Engineer to receive an RA (Return Authorization) number. This will begin the repair process.
>
> **USA:** 714.491.1500 or 800.633.9876   **Europe**: 31.33.453.4040
> **Asia**: 65.6383.4400   **Japan**: 81.3.3511.7655

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

Extron Headquarters	Extron Europe	Extron Asia	Extron Japan	Extron China	Extron Middle East	Extron Korea	Extron India
+1.800.633.9876 (Inside USA/Canada Only)	+800.3987.6673 (Inside Europe Only)	+800.7339.8766 (Inside Asia Only)	+81.3.3511.7655 +81.3.3511.7656 FAX	+4000.398766 Inside China Only	+971.4.2991800 +971.4.2991880 FAX	+82.2.3444.1571 +82.2.3444.1575 FAX	1800.3070.3777 Inside India Only
Extron USA - West +1.714.491.1500 +1.714.491.1517 FAX	Extron USA - East +1.919.850.1000 +1.919.850.1001 FAX	+31.33.453.4040 +31.33.453.4050 FAX	+65.6383.4400 +65.6383.4664 FAX		+86.21.3760.1568 +86.21.3760.1566 FAX			+91.80.3055.3777 +91.80.3055.3737 FAX